

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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On the Structure of Cast Steel Ingots.

Among those who have made the manufacture of steel a subject of scientific study, D. Chernoff occupies a prominent place, and English and American metallurgists are much indebted to Mr. William Anderson, of Erith, for performing the task of translating his papers read before the Imperial Russian Technical Society. Chernoff's latest contribution to the metallurgy of steel is an elaborate essay on the structure of cast-steel ingots, a translation of which has been published by the Institution of Mechanical Engineers, from which we take the following:

In view of the immense advantages which accrue from the facilities offered by the process of casting, every effort ought to be

made to detect and counteract causes leading to failure of producing good steel castings. The chief defect is the honey-combing, caused partly by the presence of gas bubbles and partly by cavities due to contraction in cooling. Occasionally external cracks are developed, or the texture of the steel becomes such as to prevent its use for castings. A thorough inquiry into these causes must precede all attempts at improvement. Taking the simplest form—that of a cylindrical ingot cast in a metallic mold—the metal will, instead of being a solid mass, present a casting permeated by a number of cavities, as shown in Fig. 1. Along the surfaces in contact with the mold, many bubbles penetrate into the body of the ingot more or less deeply, according to the circumstances under which it was cast and the quality of the steel used, giving the external layer a spongy appearance. A large cavity, having the shape of an irregular funnel, is formed in the upper part of

the ingot. This cavity penetrates deeply along the axis of the casting, and is surrounded by unsound metal. A certain thickness of metal included between the spongy crust and the porous heart, appears to be sound and compact. Under certain circumstances bubbles are not formed, but instead a needle-like, acicular structure, indicated on the left of Fig. 1, is strongly developed. An examination of the fractured surface shows that the acicular layer consists of a conglomeration of irregular prismatic bodies, arranged at right angles to the sides of the ingot, as shown in Fig. 2. The cohesion between the prisms is not great, so that ingots having this structure break up with comparative ease, fracture taking place along the facets of the prisms and presenting a dead, silvery hue.

with the varying rate at which the bubble grows in volume compared to that at which the thickness of the solid layer increases. It will assume the shape shown in Fig. 4, if the former is more rapid; that of Fig. 5, if the rate of both is approximately equal, and that of Fig. 6 if the setting of the steel goes on very rapidly, the latter case being very rare, however. M. Chernoff states that the best method to arrest the formation of these blow-holes in the outer crust is to cast the steel hot. Steel of a certain temperature will give sound castings in a sand mold, while it makes a porous ingot in a metallic mold. An extremely interesting experiment which has been frequently repeated, namely, that of pouring moderately hot steel into a mold half metallic and half lined with sand, always gave ingots porous in contact with

of the casting have set, or if the plunger cannot follow the shrinkage of the steel, because its movement is arrested by solidification of the other portions of the ingot. Figs. 9, 10 and 11 represent a 3-ton compressed ingot, 21½ inches in diameter and 5 feet 7 inches long, which was pressed for three-quarters of an hour, while later experience has taught that one hour and a quarter is necessary in order to produce sound work. While the blow-holes of the outer layer generally present a clean, silvery appearance, the contraction cavities of the top part of the ingots are found to be covered with minute crystalline growths, an enlarged view of a group of which, taken from a 27-ton ingot, is given in Fig. 12. These crystals are of the skeleton or discontinuous

more prevalent with the harder varieties of steel. The chemical composition of these crystals does not vary from that of the body of the steel. When the metal is still hot and fluid the crystals form one solid mass by constant accessions from the still melted metal. When, however, toward the center of the ingot this supply ceases and the metal becomes viscous, the structure of the steel becomes more and more porous. Fig. 15 shows a portion of this central part. On the other hand, the more closely the crystals are packed together the quicker their branches grow, the more difficult it becomes for the metal to flow to the crystals in the course of formation, notwithstanding that the steel remains very fluid. This state of things exists during the solidification of the external layers of an ingot cast in a metallic



Fig. 1.

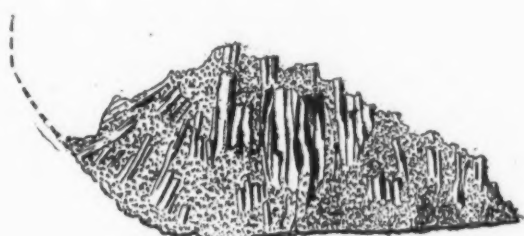


Fig. 2.

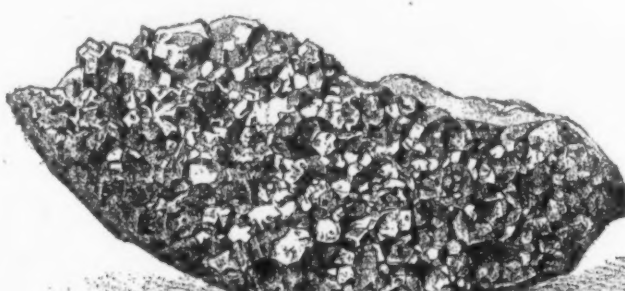


Fig. 3.



Fig. 4.

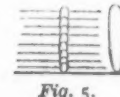


Fig. 5.

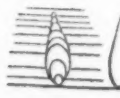


Fig. 6.

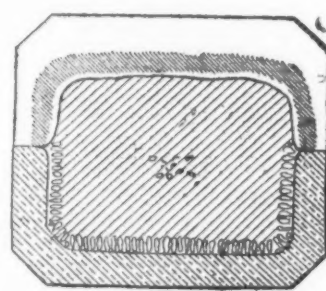


Fig. 7.

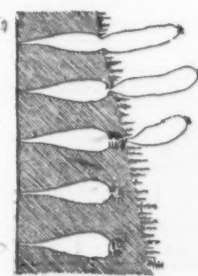


Fig. 8.

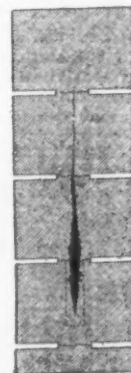


Fig. 9.

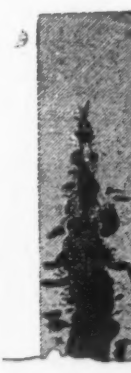


Fig. 10.



Fig. 11.

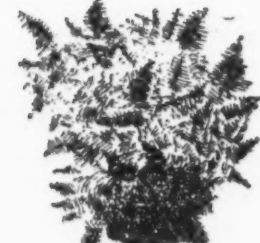


Fig. 12.



Fig. 13.



Fig. 14.



Fig. 17.



Fig. 18.

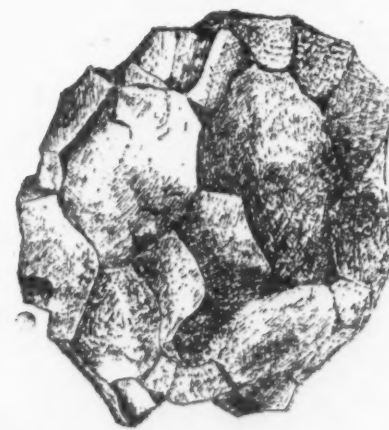


Fig. 19.

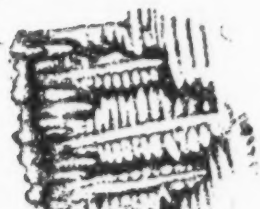


Fig. 15.



Fig. 16.

THE STRUCTURE OF CAST STEEL INGOTS.

made to detect and counteract causes leading to failure of producing good steel castings. The chief defect is the honey-combing, caused partly by the presence of gas bubbles and partly by cavities due to contraction in cooling. Occasionally external cracks are developed, or the texture of the steel becomes such as to prevent its use for castings. A thorough inquiry into these causes must precede all attempts at improvement. Taking the simplest form—that of a cylindrical ingot cast in a metallic mold—the metal will, instead of being a solid mass, present a casting permeated by a number of cavities, as shown in Fig. 1. Along the surfaces in contact with the mold, many bubbles penetrate into the body of the ingot more or less deeply, according to the circumstances under which it was cast and the quality of the steel used, giving the external layer a spongy appearance. A large cavity, having the shape of an irregular funnel, is formed in the upper part of

Within the circular layer comes one of more or less pronounced granular structure, composed of irregular many-sided grains (see Fig. 3), having a dead silvery color very similar to that characterizing the surfaces of the prismatic bodies. Within this layer follows the compact metal having a brilliant solid fracture, and then comes the porous portion, which becomes more open as the core of the casting is approached.

The blow-holes contained in the outer crust of steel ingots deserve careful attention. Steel cast into a mold commences immediately in cooling to evolve minute bubbles of gas, which adhere to the first particles of steel solidified at the sides of the mold. These grow rapidly by the influx of gases from the metal surrounding them, and as the thickness of the solidified layer increases, the augmentation in volume of the layer bubbles must occur largely in a direction perpendicular to the sides. In this way the form of the bubble may vary in accordance

the metallic mold, and perfectly sound on the side next to the ganister lining. Fig. 7 represents an actual section of such an ingot reduced to one-fifth of its natural size. By solidification of the upper surface the free gases cannot escape, and they collect under the crust, acquire considerable tension and arrest the further formation of blow-holes. But if the crust is weak, the gases break through it, the pressure is suddenly relieved and a fresh evolution of gas takes place, accompanied by the formation of a second row of bubbles, chiefly in the upper portion of the casting, the effect being clearly shown by a sharp line of demarcation shown in Fig. 8. The evolution of gases does not cease until the entire solidification of the ingot, and there are, therefore, many blow-holes in the upper portions of the ingots.

Even in Whitworth compressed steel these defects are exhibited by the ingots if the pressure ceases before the central portions

type, and occasionally a twin arrangement, such as that shown in Fig. 13, is observed. This last crystal, which is shown 140 times enlarged, was taken from the contraction cavity of a 5-cwt. ingot. From the presence of these crystalline structures it is safe to conclude that the setting of steel does not take place by the uninterrupted addition of smooth layers, but by a continued growth of discontinuous crystals in a radial direction from the cooling surfaces of the mold toward the center of the ingot. There is much analogy in the setting of steel and of ordinary cast iron, and there is danger, therefore, of the production of planes of weakness similar to those well known in iron castings. It should be added that crystalline forms like that shown in Fig. 14 are also found in cast-iron contraction cavities, which points to a similarity of origin of the structure of both. M. Chernoff states that these peculiarities of the structure of the sides of contraction cavities are more marked and

mold, causing the formation of acicular outer layers, illustrated in Fig. 2, and in cross section they may be imagined to present, on an enlarged scale, an aspect like that of Fig. 16.

The weakness of cohesion between the prismatic crystals is the chief cause of the formation of external cracks during the cooling of the ingots, the number depending upon inequalities in the mold and the temperature of the metal. The surfaces of the cracks have a prismatic structure and the imprints of discontinuous crystals may be distinctly seen, as in Fig. 17, which represents in full size the surface of a crack produced in a bright red ingot, the central portion of which was still fluid. It should be noted also that owing to a tension produced by unequal cooling of the outer and inner layers, the cohesion of the crystals of the latter is considerably affected. To this tension is due also the granulated structure of the layer within the honeycombed skin, a

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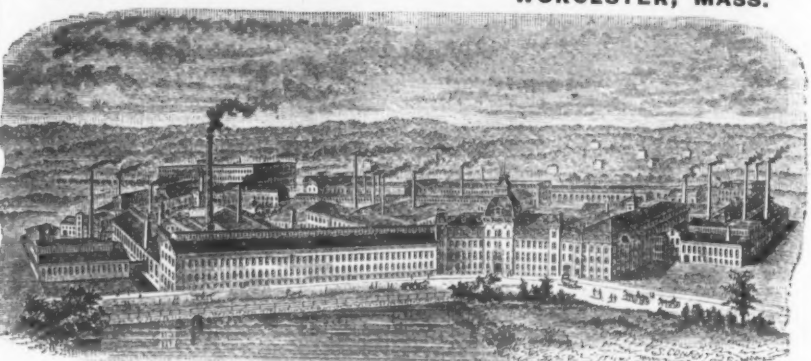
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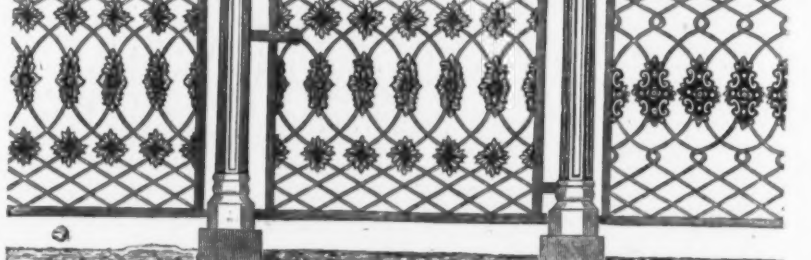
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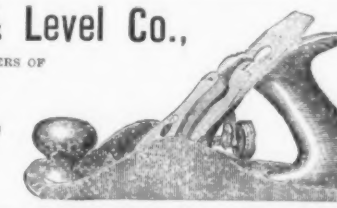
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fact which M. Chernoff has proved also experimentally. Fig. 18 represents the fracture of a highly granulated ingot, one of the grains of which is shown magnified seven times in Fig. 19.

The methods of overcoming the imperfections in steel castings may be arranged under the following heads:

1. Without altering the system of casting, to limit the ingots to the simplest forms and to work out the required shapes by means of hammers and rolls.

2. To subject the steel, during the process of setting, to heavy pressure; although the simplest forms of ingots only can be used, and forging and hammering must be resorted to to produce the shapes required.

3. To use chemical magnets in order to arrest the formation of gases, and thus to obtain castings of the most varied forms and dimensions in ordinary sand or metallic molds.

In regard to the first method little need be said, the imperfection of the drawings relating to some experiments made by M. Chernoff rendering them obscure. As far as the second is concerned, the Whitworth process of compression is discussed. More recent developments with Capt. Jones's method, as practiced at the Edgar Thomson Works and elsewhere, have placed a good method at the disposal of steel manufacturers. In the third class the Terrenoire process assumes a prominent place. Mr. Holley's elaborate paper on the subject makes further data unnecessary.

In conclusion, we may mention a suggestion thrown out by M. Chernoff referring to a means of preventing the formation of blow-holes and of acicular and granular structure. He says: "If, during the pouring of an ingot the mold were caused to rotate at considerable velocity, then the discontinuous crystals tending to form at right angles to the sides would not be in a condition to develop so rapidly as if the mold were at rest, and the steel would set in smooth layers of amorphous structure. A perfectly sound casting would be produced, which would not require hammering or pressure. No experiments appear to have been made to test this idea."

Labor and the Store System.

The New York Times, in an editorial on this subject, says:

One of the worst practical evils in the present relations between capital and labor, and one to which the champions of the latter might wisely give more attention, is the device of attaching an employer's store to the manufactory. It is by no means a commonly found system—for it could never obtain a foothold in cities and large towns, where the wholesome rule of regular cash payment of wages, as fast as earned, prevails—but it flourishes in back districts, where the ancient and thoroughly mischievous "credit" habit of dealing still lingers. Those of us who passed our boyhood in country towns may remember how almost invariable was the practice to "charge it," and to settle occasionally, or never, and how constant were the inquiry and guess whether such and such a person was "good," also that loss by bad debts was a considerable factor in the calculations and results of the country trader. This practice—born of the fewness of banks, scarcity of circulating money, and slowness of communication—lingers yet in districts where these conditions comparatively prevail, and particularly where production is confined almost exclusively to a single interest. The custom of yearly or semi-yearly settlements with purchasers is made the excuse for a tacit understanding under which employees have no right to demand payments at shorter intervals, although small sums of cash are granted as a concession and charged upon account. The extent of this concession varies with different employers, and the tendency probably is toward a slow adoption of the full cash system. Store orders are given to some extent, but as they are fully or very nearly the equivalent of cash in purchasing power at the stores where presented, they are a convenience which harms no one, unless in delaying the adoption of the cash system. Some of the largest manufacturers adopt stores on their own account, and they pay probably nine-tenths of their wages both to hands in the shops directly and to the many others who do work in their houses, in goods, the tacit, but quite distinct, understanding being that employment is granted on this condition.

Money is paid sometimes in dribbles, as a favor, but this favoring has to be regulated with discretion lest the majority remonstrate at the favoritism. The employees are free to demand money, and may get it, but the result will be that when the next year's hiring comes around, the one who rebelled at the system will be left outside. If a minor is employed, cash may be paid during minority; when he marries and sets up housekeeping the store will get a dependent. If, however, he boards, his landlord will probably be a shopman—because the shop dominates and absorbs everything—and his board can be credited to the landlord, to be taken out in goods. The storekeeper-employer charges his own prices. As a concession to labor, he can advance the nominal day's wages 10 per cent., and can then dilute the currency in which he pays by marking up his goods 15 per cent.; he can even make the Dutch storekeeper's boast that he had just made a profit—by marking up his goods. If somebody wants granulated sugar, when he keeps only brown or A; if his prints are remarkable for ugliness and slowness; if the workman finds all the boots in stock a size too large or two sizes too small, the store has no suggestion and no answer except that there is the stock. There is no competition, for the general store on the same street has been driven out, and although there are stores in the neighboring village, there is no cash. The currency is literally what inflationists want all American money to be—non-exportable. The store resists yielding of money, for it has goods; it will not give orders to be expended elsewhere, for it has goods, and its goods are not receivable for goods at other places. The employee must live on the store—and let it live on him. For almost all

he consumes, beyond his garden produce, he must go to it, receiving money enough to tantalize him with an occasional reminder. His "dollar" is a cheat and a fiction, and if he comes out at the end of the year without finding the store a little ahead of him in the matter of balance due, he has "saved" himself for that year. The store fattens its owner, the store makes lean the place.

This is a sketch of the store system at its best; for the worst, one must inspect the Michigan mining districts—as to which Mr. Tilden might, perhaps, testify if he would—certain districts in the South, some in Pennsylvania and scattered ones elsewhere. The effects of the system are obvious. Its profitability to the employer who works it is as if he were permitted to cut his bank notes into halves and quarters, each piece being receivable as a whole note; the effect upon the employed, however, is not measured by that illustration. They must not only pay exorbitantly for what they want, but must take what they do not want; improvidence is bred in them by discouragement; their manhood shrivels, and they become mere dependents; they can neither help themselves where they are, nor muster resources enough to get away; it is hardly an extravagant figure to call them slaves.

Section 3553 Revised Statutes prohibits making or paying out any check or memorandum intended to be used as currency, and for an amount less than \$1. Other than this, we recall no United States law bearing upon the subject. But it appears that attempts to reach the evil have been made in some States. A bill was recently before the New Jersey Senate to abolish the order system and forbid any deduction by employers for debts from the cash earnings of workmen. A store order for one cent, payable in 10 years, issued by a glass-blowing concern in a southern county, was exhibited, and the peculiar form was explained as being an attempt to evade a law passed last year. The bill was amended so as to permit deductions for debts "voluntarily" contracted by laborers, and in that form, obviously, it might as well have been laid in the waste basket as passed. The store system is all "voluntary," and yet it is not. The workman is free not to accept labor on such conditions, just as anybody is free to travel around the globe—if he can manage it. Whether legislation ought to make the attempt, and whether it can successfully make it, to intervene and change the laborer's circumstances, is a question we are not prepared to answer affirmatively; yet the problem is either to change the employer's heart so that he will voluntarily renounce a system which multiplies his gains, or else to so arrange circumstances that the laborer shall have work for cash within his reach. The State cannot proceed indefinitely in ameliorating individual condition. The evil is far more obvious than the remedy; we only present it as one fit for the exertions of economists and all who wish to mediate between labor and capital.

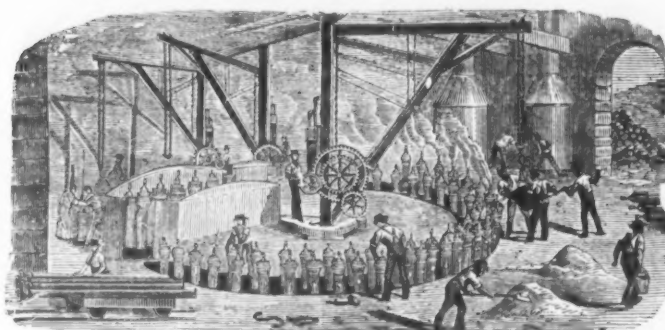
Recent Experiments in Foundry Pig.

Prof. Ledebur, of the Freiberg School of Mines, well known as a careful investigator, has quite recently concluded a series of researches in various grades of foundry pig which are of direct interest to American consumers of pig iron, as they shed some additional light on the nature of a well-known brand of Scotch pig. Besides, his experiments claim attention because they permit valuable general conclusions. The chief requirements of good foundry pig are that it can be worked easily with tools when cast, that it shrinks little, fills the mold well and shows little tendency to dissolve gases. These properties are dependent upon the presence of a certain percentage of graphite, and the separation of carbon in that form is governed largely by the presence of silicon. But foundry pig possessing the requisite qualities, when subjected to smelting in a cupola or a reverberating furnace, is subject to considerable changes. The hardness is increased perceptibly, even after the first smelting, and the shrinkage, as well as the tendency to dissolve gases, is similarly affected. A glance at the fracture of the remelted pig will show that the cause of these changes is a decrease in the percentage of graphite. The iron shows a finer grain and has become lighter in color, and, if the melting is repeated, it finally grows hard, brittle and white, being thus rendered unfit for foundry purposes. The simple expedient generally adopted to overcome this difficulty in melting scrap, broken castings, sprues, &c., is to add pig rich in graphite, and such grades are, therefore, indispensable to iron founders. But, as they are more expensive than the ordinary brands, it is naturally desirable to limit the quantity used. It might be argued that, as silicon induces the separation of carbon in the graphitic state, it might prove advantageous to use pig running high in silicon, say as much as 10 per cent. Such is not the case, however, it having been found that beyond a certain limit, generally about 3 per cent., the presence of silicon diminishes the capacity of pig to absorb carbon, and that an excess of silicon acts injuriously upon the mechanical properties of cast iron, so that a percentage giving beyond 1.5 to 2 per cent., is not regarded with favor.

It is a remarkable fact that different brands of pig having the same percentage of silicon and graphite do not act alike when being remelted, some losing their graphite and deteriorating more rapidly. No reliable experiments to ascertain the cause of this anomaly have been made, and Prof. Ledebur has, aided by Herr Scheffer, of Sterkrade, sought to solve the problem, starting from the idea that the best means of arriving at valid conclusions would be to melt one brand of pig several times. Three brands were tested—Coltness No. 1, Gutehoffnungshütte No. 1 and Gleiwitz pig. Coltness pig is largely used by German founders, who consider it valuable because it remains gray and soft, even after being repeatedly melted, because it shrinks little and makes tough castings of average strength. While Prof. Ledebur thus fairly and fully acknowledges its good quality, he distinctly states that, according to his experience, it does not deserve its reputation of being uniform, so far

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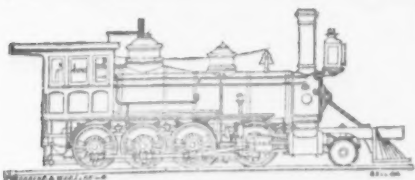
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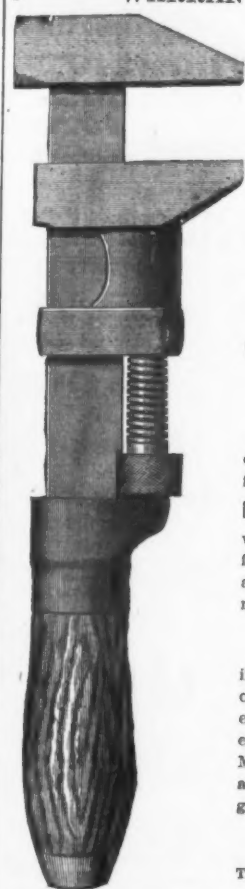
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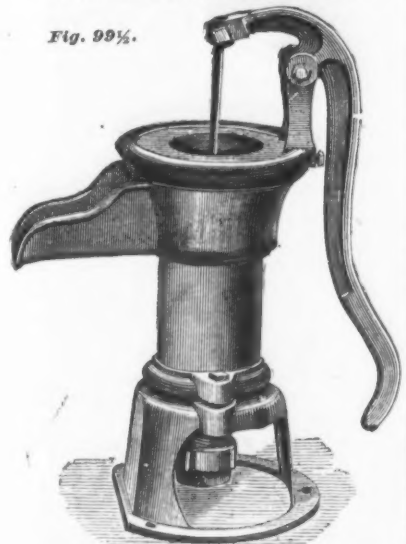
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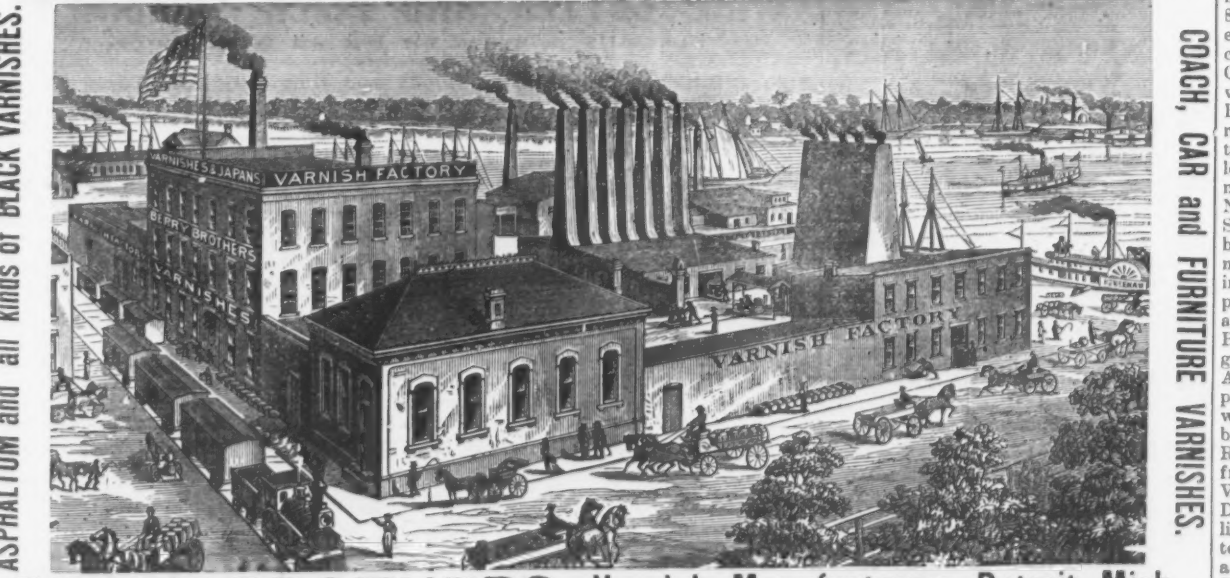


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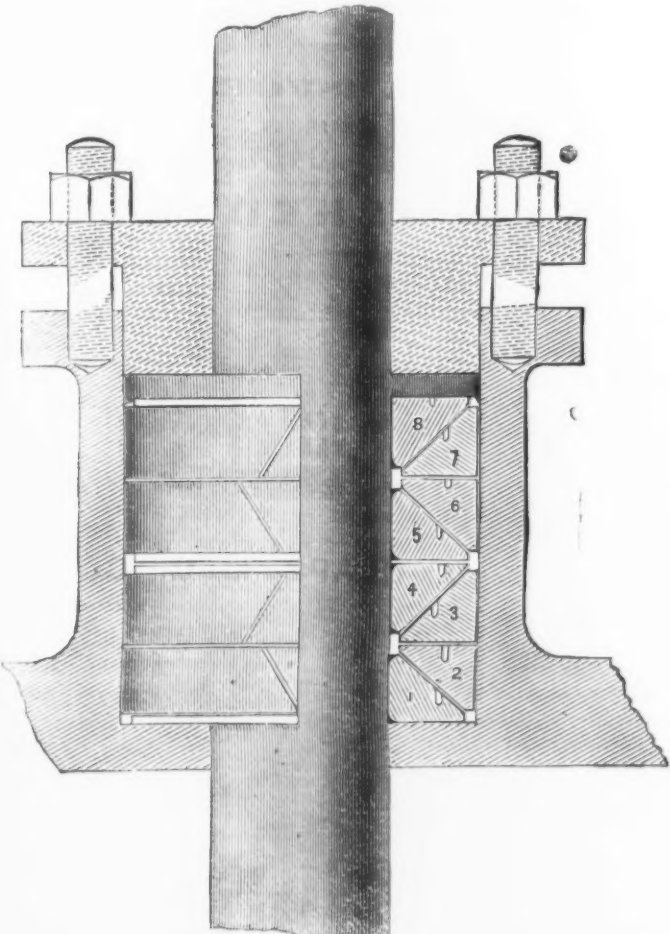
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It is known that the month since the opening of the works has been one of tribulation to the managers. They claim that though they opened out with a full understanding on the part of the men of the agreement as to wages, and though the schedule of wages was a fair one, first one gang and then another has refused to abide by it, until finally the trouble has grown to be unendurable, and the works are to be shut down. The first direct loss resulting from this was shown yesterday in the transfer of an order for nearly a quarter of a million of dollars of steel rails which had been placed with the Vulcan Company, and which was at once sent on to Pittsburgh to be filled. This order is a total loss to Carondelet, to St. Louis and to Missouri, and it is only the beginning of the loss which must follow the closing of this great establishment.
The most eloquent speeches that may be made in the convention about the resources of Missouri, its advantages for the investment of capital and the employment of labor, do not weigh as a feather compared to so grave a fact. Indeed, it looks rather absurd to contrast the enthusiastic theories of the addresses before the convention with the depressing facts going on around them, but it is no use ignoring or evading facts. Until we can manage the industries we already

this point the maximum grade is 20 feet to a mile, and through the pass it is 40 feet to a mile. From the base of the hill of Megiddo a branch is proposed, to run down the plain of Esdraelon, and thence northward along the shore through Acre and Sidon, and by the ruins of Tyre to Beyrout. Iskenderoon lies north of Beyrout at the northeast corner of the Mediterranean Sea, upon the gulf of the same name. The main line passes from Megiddo across the plain of Esdraelon, by the base of Mount Tabor, and along the west side of Lake Gennesaret. It crosses the Jordan at or near Jacob's bridge, and follows up the valley, and gradually climbs the Jebel Heish at a grade of 60 feet to a mile. Crossing the summit and descending the valley on the other side, it stretches across the plain to Damascus. Thence it is projected to the Euphrates, to connect with the Euphrates Valley Railroad, which is about to be built by an English company. From the river it extends to Mosul, and will connect there with a proposed railroad from Diabekir and the Black Sea. Branches to Aleppo and Erzeroum will be constructed as soon as desired after the completion of the main line. It is the intention of the officers of the road to push its construction rapidly as soon as the necessary authority can be obtained from the Turkish government. This authority is expected soon, through the exertions of the projectors and the English and American Ministers at Constantinople. The president of the road will depart in a



have, it would be sanguine to count on their future extension, and the painful truth evidenced by the fact is that we are not successful in retaining the industries that already seek our State and that exist here already.

The Palestine Railroad.
The Boston Advertiser gives the following information on the subject of this interesting undertaking:
Since the brief statement last month of the incorporation of the Palestine Railroad, we have learned additional facts concerning it which give the enterprise new importance. It is certain to become, when completed, an efficient element in Eastern politics. In case of peace, it will be of continuous benefit to the nations it connects; in case of war, it will give immense advantage to the power which controls it. As was understood when the charter was first made public, the Massachusetts corporations are a small factor. The real work is to be done with the financial support of two large English banking houses, and the charter was obtained with the minimum amount of capital and number of incorporators. There are in the company 15 men, with each one share of stock at \$100; 8 of the 15 live in Massachusetts—just enough to come within the law. Under the charter the proposed road will extend from Cairo in Egypt to Mosul, on the River Tigris, with branches to Jerusalem, Jaffa, Nablus, Beyrout, Aleppo, Iskenderoon and Erzeroum, if it should be judged best to build them. In detail the route is described as follows: Beginning at Cairo, the road runs northward on the Pelusiac branch of the Nile to Port Said, the northern end of the Suez Canal. At this point connection will be possible with the lines of steamers running between the East and Europe. Turning eastward from Port Said, the road will pass over the level plain near the sea shore, across the desolate tract between Egypt and Palestine. Soon after entering Palestine it goes through Gaza, Esdud, (the ancient Ashdod,) and thence to Ramleh. At this place the branches for Jaffa and Jerusalem will leave the main line, the Jerusalem branch ascending the Valley of the Nahr Rubin and Wadi Surar. It reaches the city from the north and west of the Gihon Valley, and the station will be at or near the Damascus gate. Leaving Ramleh, the main line runs north through the plain of Sharon to a point near the ancient Bethar, whence a branch is proposed to Nablus, the ancient Shechem. Continuing northerly from Bethar to the Abu Zabura, the road ascends that river valley and crosses the Carmel range through the Megiddo Pass. From Cairo to

few weeks for London, Constantinople and the East.
Katzenstein's Metallic Packing.
Mr. L. Katzenstein, of this city, is the inventor of a metallic packing in which he claims to have obviated the main objections to this style of packing. He makes use of a metal composition possessing sufficient hardness to insure durability, and soft enough not to injure the piston rod or valve stem with which it comes in contact. The packing consists of a number of rings, alternately convex and concave, which fit into one another, as shown in the accompanying engraving. Each ring is divided into two sections, and a gasket of soft packing is placed on the top ring for the purpose of furnishing the required elasticity. From the shape and position of the rings it is evident that the interior rings constantly tend to slide down on the exterior rings, and to press the latter out against the wall of the stuffing-box, while they themselves are forced against the rod. The packing, therefore, is self-adjusting, and a tight stuffing-box is obtained with the least possible friction. The manufacturers claim a great durability for this packing, and cite instances where it has been in constant use from one to six years.

Reduction of Wages in the Rolling Mills.—The Philadelphia Ledger says: Owing to the decline in the price of iron, the wages of the puddlers in the rolling mills in this city have been reduced \$1 per ton, and the other hands about 10 per cent. The workmen, understanding the situation, accepted the reduction, which went into effect on Monday last, without demur. The two sheet-iron manufacturing establishments in this city—Marshall & Bros. and the McCullough Iron Company—it is said, will also reduce the pay of their puddlers and other workmen in the same ratio as the rolling mills, to take effect with the first-named firm on the 3d of May, and with the latter the time is not yet definitely fixed. A visit to a few of the larger iron foundries in the northern part of the city, developed the fact that the matter of a reduction of wages of the hands in their employ had not yet been taken into consideration.
At the inquiry by the Board of Trade into the Tay Bridge disaster, on Thursday of last week, Mr. Albert Grothe, civil engineer, was the only witness examined. His evidence was purely technical. In reply to a leading question regarding the cause of the catastrophe, he attributed it to a strong

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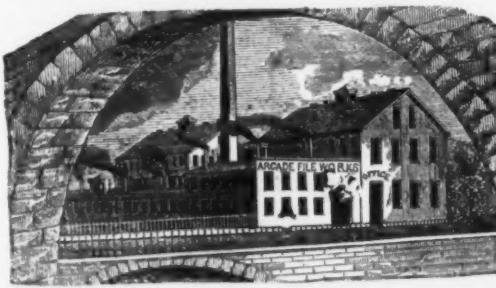
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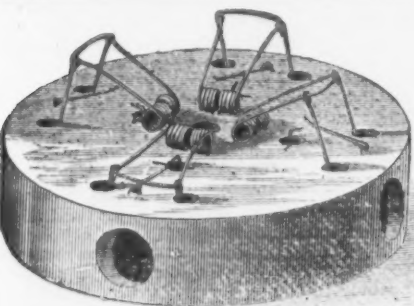
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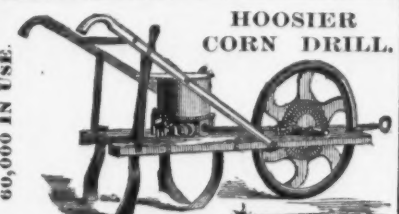
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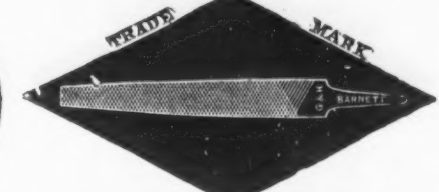
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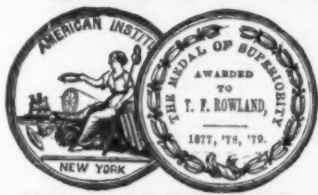
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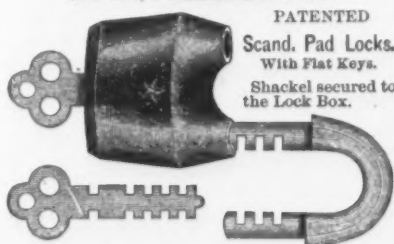
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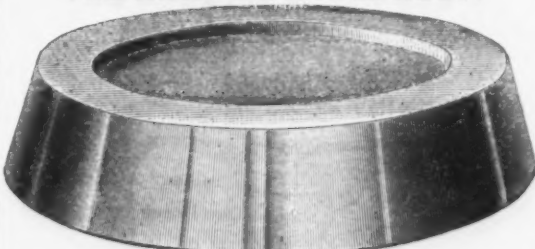
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is drawn down to a point from the rod, thus:
It is the only Hot Forged and Hammer Pointed Horse Shoe Nail, made by ma-
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Some other manufacturers claim to make a hot forged Nail, but you will observe on all such a
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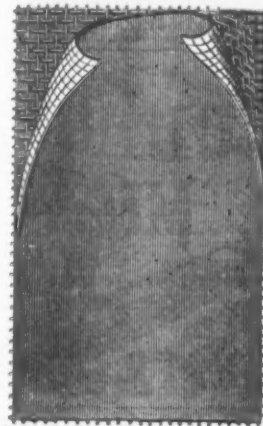
P. O. Address, Neponset, Mass., U. S. A.

THE PUTNAM NAIL CO., Boston.

wind, and also stated that there was no ground for suggesting that the bridge had been constructed of inferior materials, nor had he seen any indications of defective workmanship which would account for the accident.

Rubber Packing with Wire Cloth Insertion.

We desire to call the attention of our readers, especially those who require a water-tight packing, to an article of more than usual merit, and one that promises to obviate many of the disadvantages of the ordinary cloth insertion or plain gum packing. We refer to what is known as the Beardmore Packing, which is a sheet-rubber packing with wire cloth incorporated in the body of the rubber; the wire cloth, in fact, being used as the body to which the rubber is applied, instead of cotton cloth, as is commonly used for this purpose. The cut will give a clear idea of the packing, without any extended description.



RUBBER PACKING WITH WIRE CLOTH INSERTION.

The insertion of wire cloth, while it destroys none of the elasticity, so essential in good packing, gives it enormous lateral strength. A gasket made from it, it is claimed, cannot be blown out under pressure of steam or fluids. Each mesh of the wire cloth acts as an individual basis of strength, and also provides so many distinct shoulders to prevent the oozing or the slushing of the rubber, a very common experience when ordinary packing is used. In ordinary cloth insertion packing the cloth which gives the packing strength against lateral strain, in the course of a short time frequently loses considerable of its strength from the deteriorating influence of the material commonly used to cheapen the rubber in such goods. With the wire cloth, however, the packing will retain its full strength for an indefinite time.

In the event of packing being required of more than ordinary thickness, it will be at once apparent that it can be made by building up with alternate plies of rubber and wire cloth to the desired thickness, and while a sheet or gasket will be formed which laterally will be as rigid and inelastic as iron, it will at the same time possess the greatest obtainable elasticity as an effectual packing, and will make a joint which is absolutely steam and fluid tight.

This packing has been thoroughly tested. Samples of it may be obtained from the Akron Rubber Works, Akron, Ohio, who are the sole manufacturers.

History of the Nickel Plating Litigation.

So great and so general has been the interest awakened by the recent decision rendered by Judge Blatchford in the case of the United Nickel Company vs. Charles G. Pendleton, that we have taken some trouble to prepare a history of the nickel-plating litigation from the beginning.

The patent by which the United Nickel Company claims the art of nickel-plating in this country, was granted to Isaac Adams, Jr., on the third day of August, 1869. Two claims of this patent have been especially the subject of judicial decision. These are the first and fourth claims of the patent, and read as follows:

1. The electro-deposition of nickel by means of a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime or nitric acid, or from any acid or alkaline reaction.

4. The electro-plating of metals with a coating of compact, coherent, tenacious and flexible nickel of sufficient thickness to protect the metal upon which the deposit is made from the action of corrosive agents, with which the article may be brought in contact.

This patent, in the fall of 1870, was sold by Mr. Adams to the United Nickel Company, a corporation organized in the year 1869, under the laws of the State of New York.

Litigation on the patent commenced soon after. The first two cases were those of United Nickel Company against Anthes and United Nickel Company against Keith, before Judge Shepley, in Massachusetts.

In the former of these cases the alleged infringement was admitted, and the defense was put solely on the ground that the solution and claims of the patent were old, the defendant claiming that the solutions had been previously described in publications and patents, and that nickel plating had been used prior to the Adams patent by various persons in this country. This defense in the Anthes case was by no means complete, and only a few references were urged and a few witnesses examined.

In the Keith case, the same defenses of anticipation and prior use were urged, and this case was made much more complete in respect to these defenses, a large number of witnesses being examined on the part of the defendant, and a large amount of testimony

being taken with reference to prior use, prior books, publications and patents in which the defendant claimed the invention of the patent had been described.

In this case, also, the infringement was virtually conceded.

In his decision in favor of the United Nickel Company in these suits, Judge Shepley declared that in his opinion Dr. Adams was the first man to introduce nickel plating as an art into the United States, and the first and original discoverer and inventor of the improvements set forth in his letters patent.

The United Nickel Company went forth from these litigations with their patent sustained by a judicial decision from a high authority. But a careful investigation of the defenses urged, and points specifically decided, showed that the United Nickel Company had not maintained their claims to the whole art of nickel-plating. A careful observer, looking beneath the surface, would see that while the defense of anticipation was fairly complete and well urged in the latter of these suits, there had been practically no defense on the point of non-infringement, and while the Judge had declared in general terms his belief in the claim of Adams as first inventor of the art, he had not passed specifically on the construction of the fourth claim of the Adams patent, which in terms gave Adams the sole right to plate metals with nickel.

These litigations had taken place between the years 1870 and 1872. In the year 1873, the United Nickel Company began a suit against Harris & Weston, a firm of nickel-platers in the city of New York. This case was taken up by persons interested in nickel-plating, and a strong defense developed.

The position taken by defendants in this case differed essentially from the defense in the Massachusetts cases. There anticipation and prior use of the invention claimed in the patent were the only defenses strongly urged. In the Weston case, while the same defenses of anticipation and prior use were made much more exhaustive and complete, what was principally relied on by the defendants was that they had not infringed on the patent. They said, in effect, to the United Nickel Company: "You can have your patent; you can have your double sulphate and double chloride solutions, as claimed. We do not use them. What we do use are those solutions with the substances in which you keep out. Our solution is not neutral, but alkaline, and, therefore, we do not infringe." These and the other defenses were urged with great completeness, and expert testimony was taken at great length. The case was first brought to an argument in the spring of 1876, before Judge Johnson, who died without deciding it. In the spring of 1878 it was again argued before Judge Blatchford, who, in the fall of that year, rendered a decision sustaining the patent. In this decision he endorsed Judge Shepley's views, as expressed in his decision in the Anthes and Keith cases, as to Adams being the first introducer and inventor of the art of practical nickel-plating in the United States. As to the defense of non-infringement, he decided that the evidence convinced him that, while the substances potash and soda were introduced in a certain form in the Weston solution, the solution was so used as to be practically free from the substances potash and soda, while the process of nickel-plating was being carried on by the use of that solution, and, therefore, the defendants infringed.

Motions for injunction were soon after made by the United Nickel Company against Richardson, Boynton & Co., the Manhattan Brass Company and William H. Jackson & Co., of New York. These motions were argued about the 1st of December, 1878, by Mr. E. N. Dickerson for the United Nickel Company, and by Senator Conkling and Messrs. Frost & Coe for the defendants. The arguments of these motions were virtually a reargument and rehearing of the Weston case as to the point of non-infringement, the defendants claiming that they did not use the invention of the patent. In March, 1879, Judge Blatchford granted the injunctions, and decided that the defendants had presented no new evidence on these motions to cause him to change his views as expressed in his decision of the Weston case.

Judge Blatchford in these cases definitely decided that the United Nickel Company was entitled to the sole right to plate metallic articles with a coating of nickel in a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, as claimed. A large number of injunctions against various nickel platers and manufacturers in New York soon followed the decision of these motions, and among these injunctions was the one against Charles G. Pendleton, for the alleged violation of which the attachment for contempt was asked for in the case recently decided. Judge Blatchford decided on this motion that the well-known Gore solution was an infringement. Prior to the Pendleton case, the only solutions brought before the court had been the double sulphate and double chloride solutions, the Gore solution being included in these; but in this case the defendant was charged with violating the injunction, because he plated (as plaintiff claimed) in a solution of the double acetate of nickel and ammonia. This solution, plaintiff claimed, was a mere substitute for the double sulphate solution, for the reason that it was a neutral solution free from an acid or alkaline reaction. The defendant Pendleton showed, to the satisfaction of the court, that he had never used the double acetate solution in practical plating, but had used only the simple acetate of nickel, prepared by a process invented by himself. Other injunctions have been granted in other States in favor of the United Nickel Company, but the Pendleton case is the only one, so far as we are aware, in which any other solution than the double sulphate and double chloride has been brought to the attention of the court.

The judicial decisions, so far as regard this patent, may be summed up by saying that they sustained the United Nickel Company in their right to all double sulphate and chloride solutions, leaving nickel platers free to use all other solutions that they may be able to prove do not infringe the Adams patent for neutral solutions.

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"ELECTRIC RAZORS,"
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These shears are unsurpassed for cheapness, dura-

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Pocket Knives and
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Our Knives are guaranteed to STRIP
12 dwts. of Silver per Dozen.
All goods are put up ONE DOZEN IN A BOX.
All our Knives are put up in the latest
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Our Spoons, Forks, etc., are guaranteed to STRIP
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Sextuple Plate.
Our Hollow Ware is plated upon the
FINEST WHITE METAL, and is guaranteed
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50 Per Cent. More Silver
than any other brand of goods in the market.

OUR GOODS ARE PLATED 20 PER CENT. ABOVE STANDARD PLATE.

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NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 12 per cent. Nickel Silver, and extra heavily plated with pure Silver. Our goods are all hand burnished, and are first-class in every respect. We pack our Spoons and Forks one dozen in each box.

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Iron and Brass Wood Screws.

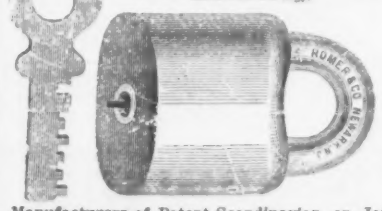
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INDUSTRIAL ITEMS.

NEW JERSEY.

The National Iron Works, of New Brunswick, have been compelled to greatly increase their force, in consequence of large orders for machinery used in the manufacture of india rubber goods. They are also quite busy in the manufacture of their National steam pump.

PENNSYLVANIA.

The Pottstown Iron Company are putting the electric light into the stock, cast and engine house of their furnace.

The Monocacy Furnace turned out 200 tons for the week ending the 10th inst.

The Rockland Furnace, Old Sally Ann, recently purchased and put in blast by the Rockland Furnace Company, is making 40 tons of charcoal iron a week. The company expect shortly to increase the production to 60 tons.

On the morning of Monday, the 19th inst., the main building of the Western File Co.'s works at Beaver Falls was completely destroyed by fire. The loss is estimated at \$300,000, \$125,000 of this being covered by insurance. The work of rebuilding has been commenced.

Stack No. 1, of the Crane Iron Company, Catasauqua, went out of blast on the night of the 18th inst., and will never be put in blast again. This stack was put in blast on the 4th of July, 1830, and was the first furnace in the Lehigh Valley that successfully made iron with anthracite coal. The stack will be torn down and replaced by one having the latest improvements. Stack No. 3 will probably be ready for blast by July.

The new engine of the Mt. Hickory Iron Company has been tested, and is reported to have worked admirably. It is a massive piece of machinery, weighing about 75 tons. The size of the steam cylinder is 36 x 48 inches; blowing cylinder, 48 x 84 inches. It is said to be the largest upright engine in the valley.

The Hollidaysburg Furnace is producing from 140 to 150 tons per week.

It is stated that the Duncansville Rolling Mill has shut down for an indefinite period.

The Glen Rolling Mill, situated near the Lehigh Valley depot, Allentown, started work last week, and have all the furnaces in blast with the exception of one. About 100 men are employed. It has been lying idle for several years, and owing to its dilapidated condition, a great amount of repairing was necessary to render it fit for use.

There is talk that a bottle-glass manufactory will soon be started in Blossburg.

The Pennsylvania Steel Company's rail mill turned out, on the night shift of the 8th inst., 936 finished steel rails, the total length of which was five miles 552 yards. This product was turned out in 12 hours, the aggregate weight being 208 3/4 tons.

Messrs. Eugene Bordia, Ethelbert Watts and John Steel Twells, of Vesta Iron Furnace of Marietta, have been actively engaged for the past three months looking for an eligible site for the erection of a blast furnace at tide-water. They have decided upon South Chester as the most desirable point, and now have the option from the Reading Railroad of buying what land they may require adjoining Marcus Hook. It is proposed to start with a capital of \$300,000, of which one-half has already been subscribed.

The Philadelphia Bridge Works of Corrode & Saylor have orders amounting to 6000 lineal feet of iron bridge, in 60 spans. Among these orders is one of 12 spans for the Texas Pacific Railroad; and another for two railroad bridges and two turntables for Japan. One hundred and seventy-five men are employed at their shops at Pottstown.

It is reported that the managers of the Reading Hardware Company are considering the advisability of removing their foundry and machine shops from Reading to Robeson, Berks County.

Nine different veins of iron ore have been recently opened on land near Macungie, ranging in thickness from 5 to 15 feet. Analysis of the ore, it is claimed, shows that it contains 56 per cent. of pure iron.

Some weeks ago the Missouri Furnace Company brought suit in the United States Circuit for damages against Boyle & Hazlett, of Fayette County, coke manufacturers, claiming \$100,000 damages for failure to fill a contract for delivery of coke. We do not know the particulars, but are informed that a compromise has been effected by the payment to the furnace company of \$12,000.

PITTSBURGH AND VICINITY.

Lewis, Oliver & Phillips' wire mill is now lighted by the Brush electric light.

Wm. Smith & Sons, iron founders, of this city, recently shipped two of their new furnaces, for manufacturing gas from petroleum, to Sacramento, Cal. They also shipped one to Chicago for the purpose of lighting up the C. & N. P. R. R. shops, and some time ago shipped furnaces to Australia and New Zealand.

H. K. Porter & Co. have just shipped their first locomotive to Japan, and another will follow in a few days. These are the first locomotives sent from the United States to Asia.

The Iron City Bridge Company has been notified that, in connection with the Union Foundry Co., of Chicago, they had received the contract for furnishing the ironwork to be used in the construction of the new Union depot, to be built in Chicago. This depot will be for the use of the Pittsburgh, Fort Wayne and Chicago Railroad, Chicago and Alton, and Milwaukee and St. Paul roads.

Pittsburgh councils have awarded to Jas. Marshall & Co. the contract for furnishing the city with cast-iron water pipe, as follows: Straight pipe, \$58 per ton of 2000 pounds; special castings, \$78.50 per ton.

It is probable that the Massillon, Ohio, Bridge Co. will receive the contract for building five county bridges in Allegheny County. The entire length of the superstructures of the bridges is estimated at 438 1/2 feet, and the cost, \$8895. They will be built of iron.

It is reported that the Phoenix Glass Works are to be removed to Phillipsburg, Beaver County.

Among the business returns of Allegheny

City filed in the controller's office last week, are the following: DeHaven & Co., foundry, \$5000; Koehler Bros., scrap iron, \$66,758; Leggett Spring and Axle Co., \$130,053; Smith, Sutton & Co., steel, \$385,273; Pittsburgh Iron Paint Co., \$18,000.

It is expected that about 4,000,000 bushels of coal will leave Pittsburgh for points down the river on the present rise.

The greatest daily output yet attained by the new 20-foot Edgar Thomson "B" Furnace is 143 tons. This output is better than the Lucy Furnace has ever made.

MARYLAND.

The Warren Glass Works Co. is a new concern lately organized. They are erecting works at Cumberland for the manufacture of lead and flint glass blown hollow-ware, and will be fully in operation next fall. They start with one eight-pot furnace. The building will be a one-story frame, 160 feet long, 60 feet wide and 35 feet in height.

OHIO.

The Western Lock Company, Geneva, employ 100 hands in the manufacture of fine cabinet locks. They are very busy, being crowded with orders.

We learn that it is proposed to erect a very extensive furnace plant on what is known as the Herrold property, opposite Floodwood Station, on the Columbus and Hocking Valley Railroad. It will consist of two stacks, 17 x 60, and the preliminaries are being arranged to complete the work during the season. The work is understood to be the enterprise of Eastern iron manufacturers, who have associated themselves with Mr. W. D. Lee, of Newark, Col. Isaac B. Riley, who became identified with the mineral interests of that section while chief engineer of the Newark, Somerset and Straitsville Railroad, will, it is said, have general charge of the construction. Nearly 3000 acres of land have been purchased by the company, all of which is underlaid by the "great" coal seam, and on which it is believed there is an abundance of ore. Other new furnaces are being talked of in the district. The outlook for the Hocking Valley in 1880 is certainly of a most encouraging character.

The Lowellville Furnace of the Ohio Iron and Steel Company is now in blast.

Grant Furnace fired up on the 22d inst., and was to have put on the blast on the 26th. She went out in the latter part of last month, and will make warm-blast car-wheel iron on this blast.

The old Leetonia nail mill has been dismantled, all the machines having been sold.

A telegram dated Steubenville, April 22, says that the Mingo Iron Works shut down on that day for an indefinite time. They had just completed relining one of their furnaces, but, owing to the limited demand for iron, decided to close the entire works for the present.

Brown, Bonnell & Co., Youngstown, are running their nail factory to its fullest capacity. They are extending the factory, are putting in a number of nail machines purchased from the old Leetonia factory, and have nearly completed a large heating furnace.

It is stated that another glass factory project is on foot at Martin's Ferry, to which the citizens of the place are said to be subscribing liberally.

The new furnace of the Mahoning Valley Iron Company is being pushed forward with great rapidity. It is anticipated that the fires will be lighted on May 1.

The Jefferson Iron Works, Steubenville, is stopped for repairs. They are putting in a new battery of boilers.

KENTUCKY.

Clear Creek Furnace, Bath County, has now 3000 cords of wood cut, and will be ready to commence making iron about the 1st of July.

It is expected the Estill Furnace will be put in blast about the 1st of May. This furnace was built in 1831.

ALABAMA.

The large mill of the Birmingham Rolling Mill Company is rapidly nearing completion, with very good prospects of commencing work by the latter part of June.

Ground has been broken at the site of the two new furnaces which the Eureka Iron Co. propose to build, near Birmingham.

Birmingham is talking of erecting a large nail factory.

The Southern Iron Ore and Mining Co. report a contract of 5000 tons of brown hematite for the Pittsburgh (Pa.) district. It is understood that they have very favorable rates for transportation of the same.

MICHIGAN.

The old Chocoley Furnace, near Marquette, which is owned by the Northern Iron Company, is to be put in blast as soon as some necessary repairs to the stack can be made. The furnace is one of the first built on the upper peninsula, but, owing to mismanagement and financial difficulties, went out of blast soon after starting up, and has been idle ever since.

MISSOURI.

Kings and, Ferguson & Co. expect to have their new foundry completed and put into operation within 30 days.

The Curtiss Stove Company are unusually busy for this season of the year. They are now melting about 75 tons of pig iron per month.

TENNESSEE.

There was a meeting of the stockholders of the Roane Iron Company, at their Office in Chattanooga, on the 23d inst. The old directory was retained. On account of failing health, Hon. W. P. Rathburn, who has been president of the company nearly ever since its organization, tendered his resignation, which was reluctantly accepted. Capt. H. S. Chamberlain, for many years the vice-president and general manager, was chosen to fill the vacancy. H. Clay Evans, the late secretary, was made vice-president, and general manager, and S. B. Strong was elected assistant manager. All three of these gentlemen have been connected with these large works most of the time since they went into the hands of the present company. They have actively supervised the enlargements and improvements, the building and operating of the steel rail plant, &c.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

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BREECH LOADING GUNS.



COLT'S

PARKER'S and

REMINGTON'S

BREECH LOADING GUNS.

HARTLEY & GRAHAM,

Post Office Box 1760.

NEW YORK.

17 and 19 Maiden Lane.

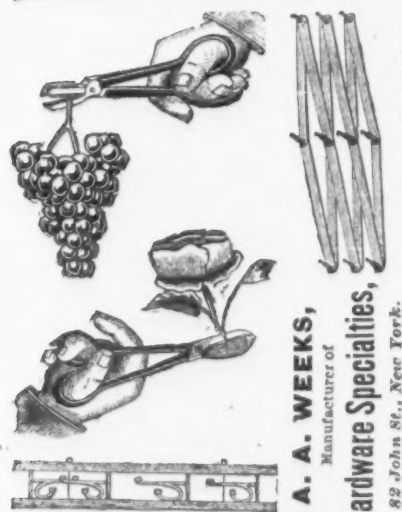
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AMERICAN BREECH LOADING
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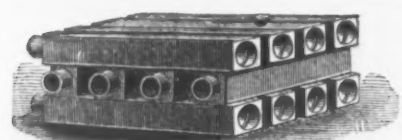
CHEAPEST AND BEST GRADES.
ENGLISH MUZZLE LOADING
BELGIAN " "
FLOBERT RIFLES, Plain and Remington System.

BRITISH BULL DOG REVOLVERS, 38, 44 and 45 Calibre.

Agents for COLT'S and ROBIN HOOD line of REVOLVERS, BRIDGEPORT GUN IMPLEMENT CO.'S GOODS, UNION METALLIC CARTRIDGE CO.



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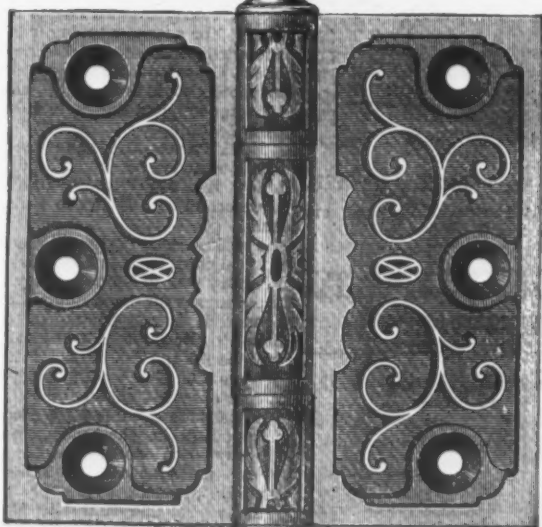


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Wyckoff Patent Wood Water Pipe,
Steam Pipe Casing,
Chain Pump Tube, Curbs, Reels, Rubber
Valves, Chain, &c.
Established 1866. Send for pamphlet.
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THE CLARK MFG. CO.,

Successors to
MANUFAC

CLARK & CO.,
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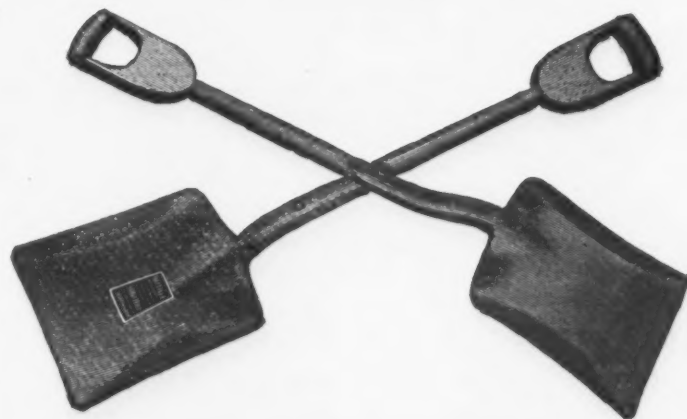


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SHOVELS,
SPADES and
SCOOPS.

PROVIDENCE TOOL CO.

Providence, New York, Boston, Chicago.



Wrist & Ankle Shackles.

REVERSIBLE

ICE AND FLOOR SCRAPERS,

MADE BY

PROVIDENCE TOOL CO.,

Providence, R. I.

The advantage of this scraper is that each cutting edge can be changed as fast as worn, and present a new and sharp cutting edge. Thus the scraper can be used all winter and the whole blade made available. It is especially useful in cleaning ice from sidewalks. Price, \$9 per doz.



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Manufacturer of
Brass, Iron, Steel and German Silver
SCREWS,
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N. Y. Mallet and Handle Works



Manufacturers of
Calkers', Carpenters', Stone Cutters',
Tin, Copper and Boiler Makers'
MALLETs,

Hawking Beetles, Hawking and Calking Irons:
also all kinds of Handles, Sledge, Chisel and Hammer
Handles. Also

COTTON AND RALE HOOKS.
Patented Feb. 13, 1877: a new combination of Hooks.
456 E. Houston St., New York City.

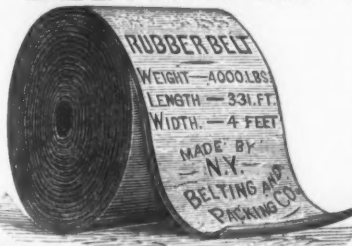
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Vulcanized Rubber Fabrics

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RUBBER BELTING and PACKING.

Machine Belting,
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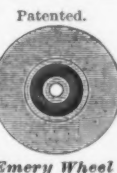
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Trade-Mark Decisions.

We are indebted to Mr. Francis Forbes, secretary of the United States Trade-Mark Association, for the following synopsis of all the reported decisions which have been rendered in the courts of this country, with the exception of those of New York, on questions affecting trade-marks:

§ 1. *California*.—It was held in *Woodward vs. Lazar* (21 Cal., 448, 1863), that the name of a hotel is a trade-mark in which the proprietor has a valuable interest, which a court of chancery will protect. A tenant giving a particular name to a building, as a sign of the hotel business, for which he uses it, does not thereby make the name a fixture of the building and the property of the landlord upon the expiration of the lease.

In *Derringer vs. Plate* (29 Cal., 292, 1865), that the right of property in a trade-mark is recognized by the common law, and is not limited by territorial bounds. The California statute of 1863, concerning trade-marks, does not take away from those who do not register their trade-mark according to its provisions their common law remedy.

In *Falkenburg vs. Lucy* (35 Cal., 52, 1868), that by the terms "peculiar name, letters, marks, devices, figures, or other trade-mark or name," as used in the statute concerning trade-marks (Hittell's Laws, Art. 7134), is not meant the established and proper names by which the "articles" to which they are attached and by which they are known in the market, nor something indicating their actual kind or quality, but something new—not before in use—intrinsically foreign to the "articles" themselves, and which only serves to designate them because it has been fancifully put to that use, in disregard of all natural relations. In this case, plaintiff's alleged trade-mark consisted of a highly colored picture of a wash room, &c., with the following legend interblended with it: "Standard Soap Company, Erasive Washing Powder," followed by directions for the use of the "washing powder," and the place of manufacture. The alleged imitation consisted of a label (with picture) which was the same as the plaintiff's only in the use of the words "washing powder," the directions for the use of the powder and the color of the paper. Injunction, in court below, restraining defendant from the use of his label, was dissolved.

In *Choyanski vs. Cohen* (39 Cal., 501, 1870), it was decided that "Antiquarian Book Store" is descriptive, and therefore not a trade-mark.

In *Graham vs. Plate* (40 Cal., 593, 1871), that the profits realized by defendant from sales of the spurious article under the stimulated trade-mark, is a proper measure of damages, but the recovery of the plaintiff is not limited to the amount of such profits.

Burke vs. Cassen (45 Cal., 467, 1873), was an action brought to restrain defendants whose label read as follows: "Van Wolf's Aromatic Schiedam Schnapps. A superior tonic, anti-dyspeptic and invigorating cordial. This wholesome beverage," &c. Plaintiff's label read: "Wolfe's Aromatic Schiedam Schnapps. A superlative tonic, diuretic, anti-dyspeptic and invigorating cordial. This medicinal beverage," &c. The description in either case was slightly different. Because the words "Aromatic Schiedam Schnapps" were merely descriptive of the article, (Schnapps meaning gin and Schiedam being the name of the place where manufactured,) an injunction was only granted against the use of the name "Wolfe" or "Van Wolf," or any colorable imitation of the name Wolfe, or plaintiff's label. The Court said that a label at common law is not a trade-mark, but when a manufacturer or seller of goods adopts a label to distinguish his goods from those of another, he is entitled to be protected in its use, and others will be enjoined from using the same or a colorable imitation thereof.

§ 2. *Connecticut*.—In *Bradley vs. Norton* (33 Conn., 157, 1865), it was decided that the exclusive right to a trade-mark is a species of property recognized by law. The imitation of a trade-mark, which will constitute an infringement of this right, need not be a precise copy of the original; if there is a substantial similarity, so that the community would be likely to be deceived, it is sufficient. In *Boardman vs. Meriden Britannia Co.* (35 Conn., 402, 1868), the defendants used labels similar in arrangement to those of plaintiff, but substituted their own names for that of plaintiff. Thus: "1-2 Gross L. Boardman's No. 2340 Wire Strengthened, French Tipped Tea Spoons." "1-2 Gross Meriden Britannia Co.'s No. 2340 Wire Strengthened, French Tipped Tea Spoons." The principal feature of the label (not in size of type) was the numerals designating the kind of spoon contained in the package. Defendants were enjoined. The decree in this case was the subject of review. 36 Conn., 207, 1869. In *Holmes, Booth & Haydens vs. The Holmes, Booth & Atwood Mfg. Co.* (37 Conn., 278, 1870), it was held that when the name of a manufacturing corporation designates the origin and ownership of goods manufactured by it, it will be protected in the use of its name to the same extent and upon the same principle that individuals will be protected in the use of trade-marks. Defendant corporation was enjoined against the use of its name.

Meriden Britannia Co. vs. Parker (39 Conn., 450, 1872). The plaintiffs had in their employ three brothers by the name of Rogers, who had formerly, from 1847, manufactured spoons on their own account and stamped them "Rogers." They entered the plaintiffs' employment and stamped spoons "1847, Rogers Bros., A. 1." Defendant acquired the right from other brothers named Rogers, not in his employ, to stamp their name on spoons. He stamped his spoons "C. Rogers Bros., A. 1," and "C. Rogers & Bros., A. 1," and was enjoined. The court declined to enjoin the name "Rogers" when used alone.

§ 3. *Georgia*.—In *Ellis vs. Zeilin* (42 Ga., 91, 1871), the plaintiff claiming proprietorship of a medicinal preparation, "Dr. Simmon's Liver Regulator or Medicine," filed a bill against defendants, alleging that they sold a preparation called "Simmon's Genuine Liver Medicine," put up in packages similar in form and size to his, to take advantage of the reputation of his medicine. Defendants demurred, thus admitting the allegations of the bill to be true. Their demurrer was overruled

and an injunction directed to issue. On appeal, judgment affirmed. The court say: "In matters of trade-mark we lay down the rule to be, that, in order to authorize the interposition of a court of equity, the title to the use and enjoyment must be clear and unquestionable, and will be adjudicated only upon the rights of parties before the court and as between their conflicting claims, and not with a view to the guardianship of the public upon the merits or demerits of nostrums, except in cases where injury to the public health or morals enters into the ingredients of the allegations."

§ 4. *Illinois*.—*Candee vs. Deere*. (54 Ill., 430, 1870.) The plaintiffs were manufacturers of plows at Moline, Ill., and claimed as their trade-mark the words "Moline Plow," which they used in their circulars, price lists and advertisements, but did not place upon the articles manufactured. Defendants made the same use of these words. It was held that "Moline Plow" did not become plaintiff's trade-mark, because not affixed to the articles manufactured, and because the words were a generic term indicating the place at which the plows were made. The plaintiffs stenciled on their plow beams the words "John Deere" in large heavy capitals in the segment of a circle, and the words "Moline, Ill." in a straight, horizontal line underneath, in smaller capitals. Defendants stenciled the words "Candee, Swan & Co." in smaller capital letters on a segment of a circle, at least 2 inches longer than that of "John Deere," and the address "Moline, Ill.," in still smaller capital letters, on a straight, horizontal line underneath. Held that while there was some resemblance between these brands, there was no such similarity as would show that "Candee, Swan & Co." intended thereby to sell their plows as plows manufactured by "John Deere."

§ 5. *Indiana*.—*Sohl vs. Geisendorf* (1 Wilson's Sup. Ct., 60, 1871.) Plaintiffs purchased a trade-mark, mark or label for flour in this form: "White Rose Mills," "Snowflake," "Sohl, Wild & Co." They substituted their own firm name of "Sohl, Gibson & Co." Held that their title to whole mark or label was good. It is an infringement of a trade-mark, even though the imitation and original, when placed side by side, would not mislead, if the similarity is such that a difference would not be noticed when seen at different times or places.

§ 6. *Kentucky*.—*Laird vs. Wilder* (6 Bush, 131, 1872). Defendant unwarrantably adopted, to mislead the public, the design of the bottle and the label of plaintiff's preparation. The imitation was so nearly exact as to be well calculated to produce the desired effect. The plaintiff put his compound upon the market with the express, as well as implied, assurance that it was "free from all mineral and poisonous substances." The evidence showed that it contained poisonous substances. Injunction refused. *Harden, J.* said: "To a party thus presenting himself, a court of equity, adhering to the maxim that 'he who asks equity must come with pure hands,' will not lend its aid when the object to be effected is to secure him the exclusive privilege of deceiving the public in a particular way, although, in doing so, it might prevent another equally guilty from committing the same wrong."

§ 7. *Louisiana*.—*Wolfe vs. Barnett & Lyon* (24 A., 97, 1872). Plaintiff claimed as a trade-mark—"Wolfe's Aromatic Schiedam Schnapps." Defendants' labels were colorable imitations of those of plaintiff. The court said: "It is in vain to urge that the several words of plaintiff's trade-mark are not new. His combination of the words was new, and indicates the origin and ownership of the liquor, and the defendants have no right to filch this combination, or any important part of it, in such a way as to mislead the purchaser as to the real origin and ownership." Defendants had used their labels for ten years. Held, no defense. Injunction. Damages.

§ 8. *Maryland*.—*Stonebraker vs. Stonebraker* (33 Md., 252, 1870). *Brent, J.* said in this case: "While a party has the right to manufacture and sell any article he may please, not protected by letters patent granted to another, he has no right to use the trade-marks or names previously adopted and used by another trader, and induce thereby the public to believe the articles sold are another manufacture. Trade-marks are property, and as such the title to them will receive the protection of the courts. If used by another without the authority or sanction of the owner, he will be restrained by injunction, and that even when it does not happen that there was any fraudulent intent in their use. He will also be held to account for the profits derived from the unauthorized use of such trade-marks." Plaintiff's marks were: "Stonebraker's Nerve and Bone Liniment," &c. The defense was interposed that plaintiff had assumed, without warrant, the title of Doctor of Medicine, and thereby deceived the public, who had bought his medicines supposing him to be a doctor. This was overruled, as also the defense that defendant Stonebraker had the right to use his own name. The bill alleged that defendants had employed defendant Stonebraker for no other reason than that his name was Stonebraker. The Court said that "Dr. Stonebraker had a right to enter into an agreement with Messrs. Passano & Clothworthy (codefendants), or anybody else, to manufacture and sell his own medicines, but he had no right to lend or sell his name to perpetrate an injury upon his brother and a fraud upon the public. The evidence shows that the whole agreement between the parties was but a combination to deceive the public."

In *Witthaus vs. Mattfeldt* (44 Md., 303, 1875), the Court said: "The mere sale of a trade mark, apart from the article to which it is affixed, confers no right of ownership, because no one can claim the right to sell his goods as goods manufactured by another. To permit this to be done would be a fraud upon the public. But when the trade-mark is assigned to the person who manufactured the tobacco to which the trade-mark was affixed, there is no false representation to the public, because the tobacco is still manufactured at the same place, and by the same person." To justify the issue of an injunction the title of plaintiff should be clear.

(To be continued.)

The Iron Age

AND

Metallurgical Review.

New York, Thursday, April 29, 1880.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . Editor.
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Engineering, of London, in an editorial comment on the trade-revival check in that country, says: "Though prices have advanced rapidly in the United States, yet the advance has not been in proportion to that known in this country, and the margin between the prices there and here is lessened, and with it also the profits of those who have imported British iron into the United States." This will be interesting reading to those who think the advance in iron in this country has been out of all character and without parallel, and is at an end. The English market has not only advanced more rapidly, but in merchant iron it has not declined as ours has, as witness our quotations of best Staffordshire bars for the past four months. Since the advance chronicled in our cable dispatch about the middle of December to £9, the quotations have not changed, and even under the decline of our market and the weakness that has been manifest for the past six weeks, their market has maintained its price. Engineering further remarks, in regard to

its own market: "It is not likely that we shall see a much greater fall in the prices of iron here, for the cost of producing is likely to rise under the increased wages the sliding scales may be expected to give, and with the approach of summer exports, already very large, may be expected to rise further." If these views are correct, we have not seen the last of the surprises in store for the iron trade here. As we said last week, it may be that the "black eye" which iron has received does not indicate as much of a blow as the appearance of the confusion would suggest at first sight. But be the eye of iron more or less black, there is "no speculation in it."

English Iron and the American Market.

MIDDLEBURY, ON-TUES, April 12, 1880.

To the Editor of *The Iron Age*.—DEAR SIR: Many surprises have occurred to manufacturers of iron in times gone by, but I venture to think there has never been one more remarkable than the sudden demands America made on the Continent of Europe in August and September last, and which have continued ever since.

In August, 1879, the exports from Great Britain of pig iron, old iron and manufactured iron and steel, exclusive of tin plates, amounted to 39,064 tons, whereas the total exports to America in 1876 were 50,717 tons; in 1877, 51,801 tons, and 1878, 42,504 tons.

EXPORTS TO UNITED STATES

	Tons.
September, 1879.....	69,669
October, 1879.....	121,034
November, 1879.....	139,507
December, 1879.....	110,821
January, 1880.....	112,323
February, 1880.....	127,129
March, 1880.....	187,378

Total for 7 months, exclusive of tin plates..... 867,814

The United States have also imported large quantities of iron, chiefly in the form of rails, old rails, steel blooms and bars from Europe, whereas more than half the imports from Great Britain have been in the form of pig iron.

These exports from England are still going on, and it is highly probable that the April total, though it will not be so high as March, will exceed any other month. These heavy importations are producing their natural effect in America, and prices are coming down; prices, too, have fallen and are falling still in Great Britain, because the Americans, thinking that prices may still further recede, are holding off buying for their autumn requirements.

Now, of the 867,814 tons exported in the last seven months, no less than 464,914 tons have been pig iron, and it is to be presumed that the greater part of this iron has gone into consumption.

The exports of pig iron in March reached 106,302 tons, a quantity in excess of actual requirements; but the question which is of very great interest to the Americans and ourselves is, how much in excess?

In March, stocks of iron decreased in Scotland, in Cleveland, in Wales, in Staffordshire and in the Bessemer districts of Cumberland and Lancashire. At the present time, notwithstanding the great increase in the make of pig iron, there is not being produced in Great Britain enough for the demands made upon us, and if America is going to call upon us this autumn for as much as she took last, we are very likely to see a resumption of high prices. No doubt America is making great efforts to supply her own requirements, and she will certainly succeed in time, but hardly this year. Will then the demand fall off?

Now, sir, I have raised two or three points in this letter which you can, I think, solve. How much too much iron is America receiving? How quickly will she be able to supply herself? And, will foreign iron continue to be imported this autumn?

These questions are equally important to English and American producers and consumers.

As the questions asked by Mr. Johnson are of general interest, and as we presume his letter was intended for publication, we answer it in our columns as fully and accurately as we are able.

It is impossible to say how much the importation of iron during the past seven months has exceeded the requirements of this market. If it were possible to obtain exact information of the amount of foreign iron in yard and store, the question could be easily answered; but this information cannot readily be obtained. Estimates differ between very wide limits, and all we can say as to the excess is that it is large.

The opinion of those best informed seems to be that the amount brought here has exceeded the requirements of the market by about the amount of the purely speculative importations. It is believed that the market could have taken, with advantage, all the iron which has been imported to the account of consumers; but the difficulty is that large numbers of people who have no connection with the iron trades in any way, have been speculating in Scotch pig and English bar iron, and a very large part of the iron thus imported has gone into store.

There has also, we are informed, been a great deal of iron purchased in a speculative way by dealers, but information on this point is carefully guarded, and it is impossible to form any correct idea of the amount thus held. But for speculation, which in many cases is likely to prove unprofitable, probably not one-half of the iron which has come to this country since November last would have been sent here. We do not mean to imply by this that more than one-half of the total importation remains on importers' hands or is held to the account of speculators who cannot raise money enough to pay the duties; but we are of the opinion, nevertheless, that the importations have exceeded the actual requirements of the market by more than one-half the total amount sent here. But little, comparatively, of the

iron now coming in—the British shipments during March and the first week of April—will go at once into consumption.

The United States, it is believed by the best authorities in the trade, are now able to supply their own requirements for iron, without drawing on foreign sources. High prices and a large consumptive demand have enormously stimulated production. There are 431 furnaces in blast at the present time, with an estimated capacity of 88,410 tons per week. We may assume, therefore, that the actual production is not far from 80,000 tons per week. This is at the rate of over 4,000,000 tons per year. We have never before produced 3,000,000 tons in one year. The estimated consumption of pig iron in 1876 was 2,172,503 tons; in 1877, 2,418,216 tons; in 1878, 2,716,345 tons; in 1879, probably about 3,000,000 tons. There is no reason to suppose that the consumption this year will exceed the production to the extent of the stocks of foreign iron already on hand, or that the close of the year will not see us with a heavy surplus, presuming that importations from this time forward are unimportant.

That foreign iron will continue to be imported this autumn is extremely improbable. Makers here fully realize the fact that unless prices are put down to a point which will discourage importations by making them unprofitable, the country will be flooded with foreign iron. Consumers have already lost confidence in iron, and are buying sparingly. There is a preference for domestic iron which will enable it to compete successfully with foreign at a somewhat higher price, but makers have wisely decided to give up all idea of maintaining the difference which has hitherto existed.

There is a general feeling that there can be no confidence, no stability of values, no activity of distribution, until there are no longer any inducements to import iron, except perhaps in the small way in which it has always come. Speculation is already crushed, and we see no reason why consumers should send orders abroad, as they could probably buy from yard or store here to better advantage.

We have answered our correspondent as fully and accurately as we are able. We see nothing on which English makers can base the hope of a continuance of the demand from this country for more than a very small part of the iron they have lately sent us, nor for that much until accumulations here are considerably reduced. The business has been largely overdone. There is nothing to warrant the expectation of another "boom" this spring, but there is every warrant for the prediction of a continued large consumption throughout the year, and a fairly steady market at prices which, while giving makers a margin of profit that under ordinary circumstances they would consider satisfactory, will leave no room for speculation and offer no encouragement to importations.

Concerning the tariff, which is always a subject of great interest to our English friends, we can say, with every confidence, that there is no probability of any change this year. Should the House of Representatives pass any tariff bills—which is extremely unlikely—the Senate, we are assured on the best authority, will reject them.

Low versus High Steel.

In many departments of manufacture the question whether iron or steel shall be used, has given way to a new one referring to the grade of steel to be employed. In dealing with a material new to them, engineers and constructors must, of course, move with the utmost caution, any false step on the comparatively unexplored territory before them being apt to have serious consequences for themselves and cause severe injury to an important industry. As we have had occasion to show repeatedly, American engineers are fully awake to the value of steel as a material for bridges and other structural purposes, having in some instances boldly taken the lead in adopting it. Still, little appears to be done experimentally, on the part of manufacturers and consumers, to arrive at a very clear idea of the requirements which ought to be exacted, and opinions on the subject are still unformed, so far as the great majority of the profession is concerned. In England matters are different. Not one meeting of the great technical societies of that country passes without some discussion of this topic, and as additional facts—the result of close observation and mature experience—are submitted, many points requiring grave consideration are brought forward. Naturally, there are differences of opinion, but not until now have they led to the formation of what might be called two distinct parties, one of which advocates the use of those grades of steel which contain comparatively large amounts of carbon, and are therefore called "high" steels, while the other urges that steel low in carbon ought to be employed for structural purposes. The high steels are characterized by high tensile strength but low ductility, while the low or "mild" steel is chiefly remarkable for great ductility and medium strength. Both parties measured forces at the recent meeting of the Institution of Naval Architects, many points of interest being brought out in two papers read by Mr. Denny and Mr. West, and during the discussion which followed them. Mr. Denny, who detailed the results of long experience in the use of mild open-hearth steel for shipbuilding, gave some very important testimony in regard to

its peculiarities. He had found that with a hard plate having a mean tensile strength of 32.97 tons and an average elongation of 16.65 per cent., the former was reduced by annealing to 28.52 tons, while the latter was increased to 24.12 per cent. A ¼-inch plate of mild steel suffered only a lowering in the tensile strength from 26.6 to 24.05 tons, while the elongation was increased from 24.32 to 29.8 per cent. These figures refer to thin plates only, thicker plates having been shown to be less affected by the process of annealing. Mr. Denny argues from these tests that high steels can be brought within the desired limits of strength simply by annealing, and that the latter process injuriously affects milder grades. Dr. Siemens regarded the matter in a somewhat different light. Under legitimate loads the weaker steel was just as good as the stronger material. Up to loads going as high as 15 tons per square inch, mild steel was as stiff as the harder varieties, as the elongation under such stress would be equal in both, and when the load was removed there would be no permanent set in either. At the present time a stress of 15 tons per square inch was as much as engineers could safely tax structures like ships with, and there is, therefore, no advantage in using material of greater tensile strength. On the other hand, the use of high steel presents notable difficulties. It must be carefully annealed after being worked, a process which, aside from its inconvenience when complex shapes are produced, notably decreases its property of resisting great strains, the very ground upon which its use is recommended. Low steels, on the contrary, can be punched without injury, and do not require any annealing. Their strength, therefore, remains unimpaired by subsequent working, all that is necessary, according to the experience of Mr. Denny, being to reverse the holes in order to remove any bad effects from punching.

A very strong point, referred to by Dr. Siemens in his argument, was based upon experiments made on riveted joints by Mr. Kirkaldy for Mr. Denny's firm. It was ascertained by these tests that the joints riveted with steel rivets did not resist a greater strain than an average of 20 tons. Mr. Denny's own words were: "Taking a fair view of the matter, it would not be prudent to assume in ship riveting a higher shearing strain than 22 tons per square inch of area against, say, '19 tons for an iron rivet.' It would seem absurd, under these circumstances, to call for a high material for the body of a ship plate when the finished single riveted seam itself is not capable of resisting strains higher than a certain limit. For ordinary riveted structures, therefore, low steel has all the necessary strength, and at the same time does not call for any expensive or inconvenient method of working, like drilling or annealing, with all the risks attending it. To this we may add that there is more difficulty in producing in large masses, with great uniformity, steel high in carbon than the milder grades. It would seem, from present appearances, that the mild material is better adapted for structural purposes than the hard varieties. Judging from past experience, however, there is every probability that manufacturers will succeed in making material which, while it possesses higher tensile strength, will be more ductile, a quality which is of great service in shipbuilding, but which is less important for bridges, boilers, &c. For high grades of steel possessing a tensile strength of 50 tons per square inch and an elongation of about 5 per cent., the problem would be to adopt such methods of riveting or welding as would insure a greatly increased strength in the seam.

Range of Prices of Iron for Nineteen Consecutive Years.

In connection with one of the subjects discussed in the editorial in our last issue on the "Position of Iron," we have been led to make some investigations relative to the price of merchant iron at the two centers—Philadelphia and Pittsburgh—in order to ascertain what has been the range and average of prices for a series of years. We are aware that such figures must be used with extreme caution, and that any deductions made from them will be at best only indications. There are many circumstances and considerations that existed in these years that must be known, to give the figures their exact value in any comparison. Still they have a certain value as indications, and even for the purposes of comparison.

We have chosen the years 1855–1873, as they seem to constitute a natural period: 1855 marks the beginning of a period when merchant iron went below 3½ cents, or \$78.40 per ton, which price we have assumed as about the average limit of the advance just made; 1873 marks the beginning of a similar period; so that this space of nineteen years fills out a complete cycle of prices. We also have complete data of prices for these years.

According to the very complete tables of prices of bar iron in Philadelphia published in the report of the Secretary of the American Iron and Steel Association, during the first eight of the nineteen years 1855–1873 the average price of iron for the whole year was below 3½ cents per pound, or \$78.40, though at some dates the selling price was above this. For the last eleven years of this period it was above 3½ cents. The average price for the first eight years was \$66.46, for the last eleven years, \$94.36.

In the West, from January, 1855, to October, 1873, a space of eighteen years and nine months, or 225 months, there have been 103 months in which iron has been below 3½ cents, and 122 in which it has been above. During the years in which it was below 3½ cents, but little iron was sold at less than 2 cents, there being one case we have heard of in which it was sold at 1½ cents. On the other hand, there were years in which the selling price of iron did not go below 5 cents, and months when it did not go below 7½ cents. In this period of 18½ years there were five consecutive years when iron was 2½ to 2½ cents, and for five other consecutive years it was 4 cents and above.

Just what these figures indicate, our readers who are interested in them can determine as well as we can. But they seem to imply, even when all the circumstances are considered, that the 3½ or 4-cent price for iron is not so high a price as some have assumed to consider it. It would also be easy to show that in at least two instances during this period of nineteen years, the advance in prices was as rapid as it has been in the last twelve months; so that in this respect the latest advance is not exceptional at all, but rather in accordance with the history of the iron trade.

It could also be shown that in the history of every advance there has been a rise, a check, and a further rise. The advance in the West has received a check, and a subsequent advance may be expected, but how soon we will not undertake to say. If those who are hopeful of improvement need any encouragement, they can probably find it in the figures given above.

The European Trade Outlook.

General trade prospects in Europe are a subject of particular interest just at present, inasmuch as a lively spring trade would go a great way toward convincing the people over there that the revival of last fall was not a mere spurt, to be followed again by a prolonged period of comparative stagnation. The winter and early spring seasons, embracing the months of December, January, February and March, have been dull ones in general European trade, and the tendency in the price of most commodities has been decidedly downward. This state of affairs was explained to us as being a natural consequence of an exceptionally severe and prolonged winter, and we were assured that with the advent of fine weather the spring trade would develop with all the greater vigor. March having been all that could have been expected in point of weather, there ought to have been some signs of returning activity, but instead of this, there has been an almost universal complaint of stagnation, and most commodities have experienced a still further decline in value. A plausible reason for this dullness was given in England, so far as that country was concerned, by pointing to the elections; but on the Continent there was no such disturbing cause, yet March passed by and April came without a sign of revival.

In France the export of manufactures during the first two months of the year, taken together, has fallen off about \$4,000,000. The general situation was anything but cheerful, for aside from the deficient grain crops of 1878 and 1879, draining the Bank of France and its branch establishments of an enormous amount of gold and leaving silver in its place, there is the irreparable loss occasioned to the vineyards of the country by the phylloxera, which, together with unpropitious weather, reduced the vintage to a yield of 25,000,000 hectoliters, while the consumption of France herself is 60,000,000 hectoliters. It is true, there are preparations made for vast outlays in the way of railroads, harbor improvements, &c., which, while giving work to a great many people, will only increase the public indebtedness, already greater in France than in any other country, for it amounts to \$5,200,000,000 of government debts. A reduction of taxes is, therefore, not to be thought of, the less so as the mania for great armaments is more pronounced there than at any previous period since the war. All that is to be hoped for is that the next grain crop may make up for past shortcomings. Though rather too early in the season to make estimates safe, the crop prospects at last advices were fair.

In Germany the situation is anything but enviable. After the higher duties had gone into effect, the general revival lent continued activity to business in Germany, although, through anticipation of the changes in the duties, every merchant, dealer and manufacturer was loaded down with goods. Now that the speculative era is past, the demand is still light, consumers waiting for a further decline. Excessive militarism is, meanwhile, piling taxes on taxes, and emigration is assuming larger proportions daily. As for Austria, the want of an outlet for an exuberant production of manufactures is felt all the more keenly, as the raising of the duties in Germany deprives Austria of one of her best markets. A customs union between both, so often the subject of negotiations between them since September last, seems to be a scheme utterly incapable of realization.

In Italy the outlook is far from being a reassuring one. The taxes are crushing, and half of them go to pay interest on the public debt; the government is weak, injudicious and vacillating, and the people are being fast impoverished, the late crop hav-

ing also been deficient. In consequence of this state of things, emigration is assuming colossal proportions.

In Spain the grain crop has also been poor, so much so that 120,000 tons of wheat have to be imported to keep the people from starving. The country is politically and socially demoralized, and with the unsolved Cuban politico-economical question on her hands, and sinking deeper and deeper into debt, the outlook is not particularly promising. Holland, Belgium and Russia are getting on financially and commercially tolerably well, and so do the three Scandinavian countries, but from Sweden it is expected that 40,000 stalwart people will emigrate this year, most of them bound for the wheat growing West of America.

In England, on the other hand, the commercial developments have, on the whole, been satisfactory thus far this year, a great deal more so than on the Continent. This is due to the widespread and varied trade connections of Great Britain. But, of course, even London cannot control the general tendency of values in the long run. If business is bad on the Continent, even satisfactory trade in England cannot long counteract this influence. The excess of exports during the first two months taken together, as compared with the same time in 1879, shows the very large sum of about \$28,000,000. It is to be hoped that the proportion may be kept up for some time.

The general outlook, it will be seen, is not positively bad, but it is far from leading to great expectations, the less so as from this side no great encouragement in the shape of orders need be expected. On the contrary, various foreign goods will not unlikely be shipped to Europe, for the want of a sufficient outlet here, during the summer. There will be nothing gained by cherishing illusions with regard to the European spring trade. The happenings may be better than present prospects seem to indicate; but those who are hoping and looking for a universal "boom," have really no reason for their expectations which will bear critical investigation.

Evading High Price Contracts.

There is much complaint in business circles regarding the willingness evinced by those who contracted to purchase merchandise of one kind or another to repudiate, or "crawl out of," their contracts since the decline in prices has changed the market in the buyers' favor. This is not to be wondered at. Business men who figure closely and often leave themselves only narrow margins of profit, are very likely to squirm when compelled to receive and pay for goods bought when prices were much higher than they average in open market at the time of delivery. But the obligation which a contract of this kind imposes is as strong as any other agreement in business, and honorable business men will stand up to their agreements, unless, as is rumored to be probable in the case of contracts made for Lake Superior ore based on \$12.50 per ton at Cleveland, an agreement can be reached between buyer and seller which will be more satisfactory to both than the ore contracts now are. This, however, is an exception to the general rule, and less trouble will probably be experienced in these large transactions than in the smaller dealings between makers and manufacturers, based on contracts for iron and other materials. Many who express a determination to avoid receiving materials contracted for during "the boom," justify their course on the ground that, had the contracts proved unprofitable to the producers, they would have had serious trouble in getting them filled. There may be some truth in this; but a contract is a bond, and whoever enters into such an agreement does so with a full knowledge of the chances he is taking. He would not take the risk if he did not think that it was safer to contract ahead for what he would need than to wait until he needed it and then take the chance of getting it. He believes that the contract will give him some advantage, else he would not make it. When in the course of events it turns out that the advantage is the other way, it is neither honorable nor businesslike to make use of every little quibble which can be raised as an excuse for not keeping one's agreements. Unfortunately, there is a large class of buyers who appear to think that everything is fair in business which yields a profit, and who are now giving producers much trouble by breaking their engagements on every pretext that can be thought of. A decline in prices makes sad havoc with what a certain class of writers delight to call our "standards of business morality."

There is talk in newspaper circles in Washington about a report from the subcommittee of the Ways and Means Committee, recommending, among other things, a reduction of the steel rail duty to \$22.40 per ton. Inasmuch as there is no reasonable chance that such a bill would pass the Senate, if indeed it passed the House, it would be an act worse than foolish to report it. The *United States Economist*, for many years, as now, an advocate of free trade, points out the danger of such cheap demagogism in very plain language, which, coming from a free-trade source, is the more significant. We quote as follows:

Any general agitation of the tariff will at once retard the prosperity and best interests of the country. The people have just recovered from a long period of gloom and depression. Business men and manufacturers are beginning to recover

some of the losses that followed the panic, the commerce of the nation is improving and reviving, resumption has given steadiness and stability to values, and if legislation will keep its hands off from commerce and trade, the future is bright with promise.

At this juncture, to agitate tariff changes is to unsettle the most important industries of the land and bring back again uneasiness, distrust and insolvency. There can be no question about the need of tariff modifications, but let the country have time to recover from the long years of failure and bankruptcy before any important changes are made. The subject is one of national importance. It should not be hastily considered. No measures proposed at the latter end of a session can do justice to the matter, and its agitation should, therefore, be postponed. There is no reason at this time why general action should be taken in connection with the proposed revision on sugar and paper.

For the matter of that, we are not sure that the question of cheap paper will not sooner solve itself through the competition of domestic manufacturers than through foreign competition. As to sugar, what is needed is simply a change in the method of assessing and collecting the duties which will protect the Treasury, and avoid the endless conflict which has been waged under the present system between sharp importers and sharp Treasury agents.

Congress and the Driven Well Patent.

The House Committee on Patents, it is stated, has agreed to report a bill making certain important changes in the patent laws, among which are the following:

First.—The owner of a patent is not to be entitled to recover for its use by unauthorized persons a greater sum than the average amount paid by persons who have taken out a license to manufacture and sell the said patent.

Second.—Vendors, and not innocent purchasers of patented articles, are to be held liable for infringement.

Third.—In cases of willful violation of the rights of a patentee he shall be entitled to recover, in addition to damages, the cost of suit.

Fourth.—If an article remains unused, and so unknown, for eight years after the patent therefor is issued, the inventor's right to a reissue of the patent shall cease.

Fifth.—The fees charged inventors and patentees on the filing of applications, the issue of patents, &c., are to be reduced 20 to 25 per cent. from present rates.

The weak point of this bill seems to be in the second and third clauses. When an invention is infringed the inventor must sue wherever he finds the infringement. It is not the infringer, but the infringement, which owes him tribute. There are a very large class of patents which can only be protected by bringing suit against infringers in the possession of innocent purchasers. The driven well patent is one of them, and we imagine that this is the very patent at which this proposed legislation is aimed. A dispatch from Washington, under date of April 25th, says that Congress has been flooded with petitions, asking that something be done to put a stop to the efforts of the owners of the driven well patent to collect what they claim in royalties and damages from those who have had such wells put down by unauthorized persons. Mr. Ryan, of Kansas, has introduced in the House a joint resolution, instructing the Attorney-General to bring suit, in the name of the United States, to cancel the letters patent issued in 1868 and 1871 to Nelson W. Green for this kind of well, on the ground that Green was not the original inventor, and that the device had been in use for years in many parts of the country and had long been common property. Considering the fact that the Green patent has been sustained by decisions in thirteen circuits, and that the efforts of a combination of pump and point manufacturers, formed to resist it, to show that the patent was anticipated by such use of the invention claimed as to make it common property, were unsuccessful, we imagine the Attorney-General will not have as clear a case as Mr. Ryan seems to think.

The Ore Question in the West.

There is a point in connection with that part of the editorial from our issue of March 11 which we quoted in the article on "The Position of Iron," in our last issue, to which we wish to call attention. The part in question referred to the effect the price of Lake Superior ore for next season would probably have on the price of pig iron, and, consequently, on merchant iron. From all indications these words are as good to-day as when they were written. If our readers who are not admitted into the secrets of the iron trade imagine that we spoke unadvisedly, or that the necessity for high prices of merchant iron likely to result from high-priced Lake Superior ore has passed, they are mistaken. One of the most pressing and most perplexing of the problems of the iron trade in the West, is this one that comes with \$12.50 ore. Contracts for ore have been made for the whole season's delivery, based on these prices, and the furnace and mill men are anxiously asking for some way of relief. If iron keeps at the present or lower figures, and the ore men insist on the fulfillment of the contracts, there are serious times ahead. A ton of pig iron made at Pittsburgh out of this \$12.50 grade of ore, the freight from Cleveland to Pittsburgh being, say, \$2.50, and 1½ tons of ore being required to make a ton of pig, will represent \$22.50 worth of ore. If inferior ore or cinder is used, an inferior pig, worth less, is made. In addition to this, about 500 pounds of ore are used as flux to a ton of puddled iron, or, say, one-quarter of a ton to a ton of bars, or \$3.75 more. This makes the ore to a ton of merchant iron worth \$26.25, without coke, coal, lime, labor, wear and tear or anything else, or

about 1¼ cents per pound for ore alone. Is it any wonder that the ore question is a perplexing one—that the chief topic of discussion, when iron men meet in the West, is, What shall we do about ore? An effort is making to secure a reduction from the contract price of ore, but we are not advised whether it is with a prospect of success or not. If the ore companies insist on the contract price and the contracts are binding, the Western iron men will sigh for the 4-cent card.

All reports seem to agree that the revival in orders and trade that was to follow at once the reduction in price of iron to 3 cents East and 3.2 cents West, has not come. There has been but little, if any, improvement, and some sections report that orders have greatly fallen off. Prices, even below those given above as nominal rates, will not, it is believed, tempt buyers, and a great many manufacturers are confirmed in the belief they expressed before the reduction—that its only effect would be to reduce the price on what iron was sold, with but little, if any, corresponding gain. These parties claim that just as much iron would have been sold on, say, a 4-cent card at 3½ cents, as is now being sold on a 3.2-cent card at 3 cents. The cost of labor to a ton of iron may have been reduced \$3; but, to offset this, the actual selling price of what iron is sold has been reduced \$8 to \$12. This condition of affairs proves again the truth of the statement in the leading editorial of our last issue, that "most of those who have ventured predictions regarding the course of iron have been mistaken." Those who argued against a 4-cent card were the ones who argued in favor of the benefit to be derived from a 3-cent rate. The 4-cent card, as events proved, was unwise. The 3-cent rate, as events show, has not accomplished the wonders claimed, and the future is still uncertain. Of one thing, however, we may feel confident—the present dullness cannot continue. There are too many enterprises under way that require iron. Money is easy, immigration is unprecedented, and the consumption of iron in this country this year will exceed that of any previous year; but at what price it will be sold we do not venture to predict.

The stagnation in the merchant iron trade in the West is already having its effect on the blast furnaces. Since our report on the condition of the blast furnaces, published in our last issue, was made up, we have heard of quite a number of coke furnaces that have gone out of blast, or will do so shortly. It may be that a scarcity of ore and the anticipated high price of ore and coke may have something to do with this blowing out, but if there was any demand at anything like remunerative prices, these furnaces would continue to blow. Many of them while not in Pittsburgh are contiguous to it, being in the Shenango Valley and eastern part of Ohio. Our Industrial Items from week to week will show what furnaces blow out.

NEW PUBLICATIONS.

Knight's Popular History of England. The Standard Series. I. K. Funk & Co., Publishers, 10 and 12 Dey Street, New York.

The publishers of "The Standard Series" are doing an excellent work in placing within the reach of those who cannot afford to purchase costly works and have not access to well appointed libraries, a class of superior literature at very cheap prices. Among those thus far published in cheap form, are Carlyle's "Choice of Books," Macaulay's Essays, Arnold's "Light of Asia," Carlyle's Essays, Blackie's "Self Culture," and several of a distinctly religious character, which are well known and generally approved as among the best of their class. The most ambitious undertaking in this series is Knight's "History of England," complete in eight volumes at 30 cents a volume. The first of these, 155 pages, is at hand, and merits favorable comment. It is of quarto size, printed two columns to the page in brierly type, headed, on a good quality of white paper. This history is reprinted under an arrangement with the owners of the English copyright, and will not be abridged in any respect. The price of previous editions of this work ranges from \$18 upward.

In this enterprise Messrs. I. K. Funk & Co. deserve encouragement. The mistake of those who have previously attempted cheap editions has been in making them too cheap. They have been badly printed, and while answering very well for one reading, have been in no respect acceptable substitutes for more costly editions of the same works. "The Standard Series" avoids these defects, and for cheap republications the books are all that could be desired. The publishers are actuated by a high principle, apparently, and will publish nothing sensational or unclean. Their list will include only standard works of the very best class, and in so doing they will meet the wants of a large and intelligent class of readers, who want something better than the publishers of cheap literature have thus far deemed it profitable to furnish them.

An Expert's Story of the Missouri Tornado.

Professor John H. Tice, the well-known meteorologist, who went to Marshallfield to investigate the phenomena connected with the late storm, telegraphed the *St. Louis Republican* as follows:

"Everywhere along the track of the tornado there is evidence of a wave of water flowing in the rear of the cloud spouts. At some places there are only faint traces of such a wave. At others the debris is carried up and over obstructions two or three feet high. These waves or currents flowed in the greatest volume up hills. There are places where the entire top soil is washed away by the currents. Fibrous roots and tufts of grass show their direction to have been up hill, and what is more significant, from all points of the compass toward the top of the hill when the tornado was raging at the time and expending its force. No

trace at any point can be found where they flowed down-hill. Many level places are swept clean of soil. Leaves, grass, debris of wrecked buildings and fragments of planks carried along by the current and left in its track, arranged themselves longitudinally to the current.

The following is vouched for by George Gilbert of this place. He and his wife and four children were on a visit eight miles in the country, and the center of the tornado passed within five or six yards from where they were. A wave of water, apparently 15 feet high, rolled in the rear of the point of contact of the cloud spout with the earth. It rolled over them in a second, and was icy cold, drenching them thoroughly. About two miles northeast of the town stones weighing from 500 to 700 pounds were lifted out of the earth and carried along some distance in the track of the tornado.

"J. H. Williams, presiding Justice of the County Court and residing in Panther Creek Valley, tells me a stone fell in the center of a field belonging to H. Rose, the weight of which was estimated at two tons. It is not known whence it came."

The tornado, so far as is known, commenced in Arkansas, in Stone County. In Crow Creek settlement 10 persons were killed and on Flat Creek 6 persons were killed.

Tariff Matters at Washington.

(From our Special Correspondent.)

WASHINGTON, D. C., April 28, 1880.

Representative Tucker, chairman of the subcommittee charged with the consideration of the duty on hoop iron, by direction of the Committee of Ways and Means, has prepared a bill covering the points of controversy, and will accompany it with a report, both of which will be presented to the general committee for their action to-morrow. There is no doubt of the committee giving their approval, as Representative Gibson, having recorded his vote in favor of the Tucker bill, it will have a majority. The vote was given in this correspondence last week and has not changed. The provisions of Mr. Tucker's bill have also been given. That gentleman characterized it today as "a measure to save the contractors and to reduce the duty on all classes of hoop iron to 35 per cent. ad valorem." He added: "After the committee shall have approved the bill, it is my purpose to urge prompt action by the House."

Information received here from the iron manufacturing centers of England, and notably Birmingham, says that, owing to the procrastinating course of the Secretary of the Treasury, the importers of the United States have succeeded in getting in enormous orders, and if the bill legalizing all contracts made prior to March 12, and authorizing entry at 35 per cent. ad valorem during the present calendar year, should become a law, the supply would meet all the demand for hoop iron for months to come. The report accompanying the bill prepared by Mr. Tucker is brief. He hesitates, however, in authorizing its publication in advance of its adoption by the committee. It reviews the controversy which has been pending for more than ten years upon the question of classification and duty, and argues stoutly in favor of the interpretation that hoop iron cut to lengths is a manufacture of hoop iron, and properly belongs under the head of "not otherwise provided for."

The Eaton bill, providing for the creation of a commission to have charge of all questions pertaining to the tariff, so as to take this important subject out of the hands of a tinkering House Committee, meets with very general favor in the iron districts, judging from the number of petitions being received here almost daily by Representatives and Senators, urging them to press its adoption. Representative Bayne, of the Allegheny District of Pennsylvania, has been specially favored with these petitions, and has also had an interview with several members of the Finance Committee of the Senate on the subject. The disposition there is favorable to this bill, and an effort will be made to secure concurrent legislation on the subject at the present session.

The contemplated gathering in the valley of the Beaver in Western Pennsylvania in the interests of the tariff, and under the auspices of the Amalgamated Association of Iron, Steel and Tin Workers, meets with very general approval among the members of both houses of Congress who take an interest in an intelligent understanding of this all-important question. The postponement of the gathering until June 5, will ensure success so far as the attendance of officials from Washington is concerned, as the Republican Convention will have been held, and a number of politicians of that political persuasion were not disposed to attend until after that event. The Amalgamated Association embraces a membership of 50,000 workers in these great industries, and the object of the meeting is to stimulate and unite the tariff influence among the laboring classes. Several years ago, the manufacturers held a similar gathering, which was attended by good results and a more harmonious action in tariff matters. The coming meeting is by the working classes, and it is proposed to unite the public expressions of this class with the manufacturers and to show that labor is in sympathy with capital on this question. The governors of Pennsylvania, Ohio and West Virginia have indicated their intention to be present and participate in the proceedings. Senators and Representatives will also be present.

The Cologne *Gazette* states that a committee, consisting of representatives of the German industrial establishments which tendered an invitation to the British Iron and Steel Institute to hold its annual meeting this year in Dusseldorf, is already busily engaged in making preparations for the entertainment of the visitors. The reception will formally begin on August 25. The two following days will be devoted to discussions, the inspection of special exhibitions, and visits to various industrial establishments and mines in the Rhenish Westphalian district. On Aug. 29 there is to be an excursion by special train up the Rhine Valley to Bingen, returning by steamer to Cologne.

The *Gazette* says that the promised gathering of English and German iron and steel manufacturers on German ground will attract a very large share of attention, and expresses a hope that the efforts of the committee will be responded to by the local authorities and others in the neighborhood of Dusseldorf who are interested, in a manner worthy of the occasion.

Capacity of the Iron and Steel Works of the United States.

Mr. James M. Swank, secretary of the American Iron and Steel Association, has compiled, in the preface of his new directory just being published, the following interesting data relating to the number and capacity of the iron and steel works of this country. He says: There has been noticeable in the iron trade of this country a very strong tendency to substitute steel for iron and to increase the production of individual blast furnaces. Our steel industry is now the second in the world in productive capacity, and in a year it will pass that of Great Britain and take the first rank. The increase within the last year in the capacity of our Bessemer and open-hearth works, either completed or projected, is equal to an addition of 50 per cent. to the capacity which existed in 1878. The improvement in our blast-furnace practice is simply marvelous, and to the confidence which has been inspired in the improved practice which has been so generally adopted must be attributed the enormous annual capacity that is claimed for 697 completed furnaces, namely, 6,500,000 net tons, or 5,800,000 gross tons, of pig iron. It is well to remember, however, that, in the nature of things, all of these furnaces can never be in operation at the same time, and that the large capacity that is claimed for our rolling mills and steel works is not capable of realization in actual practice, for obvious reasons. Without further preface we present below a complete summary of the number and capacity of the iron and steel works which are described in the directory.

Number of completed blast furnaces on March 1, 1880.....	697
Number of blast furnaces building on March 1, 1880—23 bituminous, 12 anthracite, 2 charcoal; total.....	44
Annual capacity of completed furnaces, in pig iron, net tons.....	6,500,000
Annual capacity of the 203 bituminous furnaces, net tons.....	2,825,000
Annual capacity of the 28 anthracite furnaces, net tons.....	2,600,000
Annual capacity of the 266 charcoal furnaces, net tons.....	1,075,000
Number of completed rolling mills and steel works on March 1, 1880.....	382
Number of single puddling furnaces (a double furnace counting as two single ones).....	4,467
Number of heating furnaces.....	2,419
Number of trains of rolls.....	1,397
Annual capacity of rolling mills in finished iron, net tons.....	4,000,000
Annual capacity of rail mills in heavy rails, net tons.....	2,150,000
Number of rolling mills having nail factories.....	73
Number of nail machines.....	4,152
Number of completed Bessemer steel works on March 1, 1880.....	11
Number of Bessemer steel works building on March 1, 1880.....	32
Number of Bessemer converters—22 completed, 2 building.....	24
Annual capacity in ingots, net tons—completed converters, 2,250,000; new converters, 500,000; total.....	1,750,000
Number of completed open-hearth steel works on March 1, 1880.....	28
Number of open-hearth steel works building on March 1, 1880.....	3
Number of open-hearth furnaces—33 completed, 6 building.....	39
Annual capacity in ingots, net tons—completed furnaces, 225,000; new furnaces, 50,000; total.....	275,000
Number of completed crucible cast-steel works on March 1, 1880.....	35
Number of crucible cast-steel works building on March 1, 1880.....	3
Number of steel-melting pots in the completed works.....	3,080
Annual capacity in ingots, net tons.....	90,000
Number of miscellaneous steel works on March 1, 1880.....	9
Number of steel manufacturing works on March 1, 1880.....	31
Number of completed forges (one building) on March 1, 1880, (make wrought iron from ore).....	69
Annual capacity in blooms and billets, net tons.....	85,000
Number of completed bloomaries (one building) on March 1, 1880, (make blooms from pig iron).....	59
Annual capacity in blooms, net tons.....	80,000
PHILADELPHIA, April 15, 1880.	

John Brown & Co.'s Rails.

We have received the following letter, which is evidently designed for publication, and to which we take pleasure in giving space:

ATLAS STEEL AND IRON WORKS,
SHEFFIELD, April 5, 1880.
To the Editor of The Iron Age.—SIR: We notice in your issue of March 16 a statement as to the quality of English and American rails.

In this we are pleased to find such a satisfactory account of the rails supplied by this company, which speaks for itself as to their quality.

Our only desire in now addressing you is to point out that the concluding remark as to any of them having been made of crucible steel, is not correct. They were all Bessemer, hammered before being rolled, and we are quite prepared to make rails of equal quality by the same process at the present time.—We are, Sir,

Your obedient servants,
JOHN BROWN & CO., LD.
JOHN D. ELLIS, Chairman.

Messrs. Park Benjamin & Bro., Nos. 49 and 50 Astor House, New York, announce that, in connection with their regular business of furnishing the services of engineers and experts in all branches of engineering and mechanics, they have undertaken the general agency of the Holly Manufacturing Company, of Lockport, N. Y. They invite communications and negotiations with reference to water supply, and will furnish all desired information relative to the Holly direct system.

The mines at Bilbao, Spain, appear to be producing ore with great energy. We learn that up to April 3, 480,270 tons were shipped, fully three-eighths going to Germany, while the bulk of the rest is sent to Great Britain. The price at Bilbao is reported to be 12/6 per ton.

Special Notices.

WANTED.
—
ONE SECOND-HAND
14-Inch or 16-Inch
ROLL TRAIN.

ROLL TRAIN.

Address

POST OFFICE BOX 610,
SCRANTON,
Pennsylvania.

Europe.

Matheson & Grant's

Address is

32 Walbrook, London, England.

Engineers and Commission Agents for all business
relating to engineering and metals in Europe.

Telegraph address,

MATHESON, WALBROOK, LONDON.

**The Hull Forge
Company,**

Hull, England,

Roll Flat, Round, Square and Angle
BARs,
and make Steam Hammer
FORGINGS
entirely from Scrap Iron and one-half times

HULL FORGE CO.,

32 Walbrook, London.

500 SHARES (\$50,000)
Roane Iron Co.'s Stock
FOR SALE.

Rolling Mills and Steel Works at Chattanooga, Ga. Blast Furnaces at Bessemer.

NO 94, FIRST FRANCHISES AT ROCKFORD.

This company is entirely out of debt. Have large surplus. Paid regular semi-annual divi-

Best New York, Cleveland or Indianapolis references.
S. B. LOWE,
Feb. 28, 1880. Chattanooga, Tenn.

The Sherman Process Co.
9 Pemberton Square, Boston, Mass.

Issue Licenses to use the Process for the Manufacture of Iron and Steel

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of *The Iron Age* of Oct. 25th, 1877.

For Sale.

The best Real Hardware business in Western New York. Stock \$10,000 to \$12,000; sales \$35,000 in 1879, at a good profit. Will reduce stock to \$8000 if desired. For further particulars, address
D, Box 22,
Office of *The Iron Age*, 23 Reade St., N. Y.

LAMBERSON'S
PRICE BOOKS

Full Leather, \$7.50. Half Leather, \$6.50.
Pocket Edition, Full Leather, \$3.50.
DISCOUNT Bolt List, \$1.50.
Screw List, 50 cents.
Leigh's Discount Book, 50 cents.
Address all orders to *Pope & Stevens*, General
Agents, 90 Chambers Street, N. Y.

For sale at publisher's prices by Wm. Blair & Co., Chicago; A. F. Shapleigh & Co., St. Louis; C. B. James, Detroit.

A LOCOMOTIVE
OF ABOUT
80 Horse-Power, with Tender,
or sale very low, if applied for soon.
Address **BOX 27**

Bordentown, N. J.

WANTED.

An experienced, practical Miner to take charge of Miners in a Magnetic Iron Ore Mine.

References as to character and qualifications required. Address

H. BURDEN & SONS,
Troy, N. Y.

PARTNER WANTED.

To purchase interest in Agricultural Manufacturing business; established 25 years; location, Chicago. Sales can be made \$500,000 next year on present lines of goods, mostly patented. To party with from \$75,000 to \$100,000 ready capital, who will take inside management, a first-class business and large profits can be shown. None but princip-

als dealt with. Address **BOX 108,**
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

Christiana Rolling Mill Property, situated on the south side of Christiana Creek, Wilmington, Del. Main building, 90 x 130 feet, containing two trains of Rolls 30 x 96 inches, and 26 x 18 inches. Complete in all its appointments for a first-class Plate Mill. Or will grind and finish a

person having capital, experience and capable of conducting the business. Apply to
LORDELL CAR WHEEL CO.

Sanderson Bros. Steel Co.
A limited number of shares for sale by
EDWARD FRITH & SON,
241 Pearl street, New York.

Special Notices.

A. J. STEINMAN, Chairman. W. B. MIDDLETON, Supt.
W. G. MENDENHALL, Sec'y & Treas.

OFFICE OF

PENN IRON COMPANY, Limited.

MANUFACTURERS OF

Merchant Bar Iron, Hammered and

Rolled Axles, Car Forgings, Bridge

Work, Fish Joints, Bolts, R. R.

Spikes, Bolt Ends, &c., &c.,

LANCASTER, PA.

WANTED.

A Shear for splitting old rails lengthwise, with
knives from 24 to 30 inches long. Address

PENN IRON CO., LIMITED,
Lancaster, Penn.

For Sale.

Five hundred acres Gas and Coke Coal on line
of B. & O. R. R., Connellsville Branch, 38 miles
from Pittsburgh. Quality unsurpassed. The only
locality where pure Youghiogheny Gas Coal and
Connellsville Coke Coal are found in the same
vein, but completely separate. Can be mined at
less cost than elsewhere. Gas Coal seam 5 feet,
Coke Coal seam 3 feet. Analysis of Coke gives 3
per cent. of Carbon, and less than 3 per cent. of
ash. Will construct one to 300 ovens if desired,
and have same ready to produce Coke by October
1st.

WAVERLY COAL & COKE CO.,
Pittsburgh, Pa.
or, H. C. BUGHMAN,
57 B'way New York.

For Sale.

Stock of Hardware, Stoves, Implements, Tin-
ners' Tools and Stock, in South Western Iowa.
Address

Office of The Iron Age, 83 Reade St., New York.

HAMMACHER & DELIUS,

Hamburg, Germany,

62 Alter Wall,

Solicit correspondence with American Manufactur-
ers and Inventors in regard to representation
in European countries.

Splendid Investment.

The noted Carter's Furnace Iron property, in
Carter county, East Tennessee, for sale; 12,000
acres, fine timber, labor abundant and cheap,
magnificent water power, one five-ton cold blast
charcoal furnace; best car wheel iron, now yield-
ing large profit. Best New York and Tennessee
references. For terms, address

HUNSDON CARY,
Room 32, No. 35 B'way, N. Y.,
or 8 Madison St., Memphis Tenn.

NAILS FOR SALE.

A small quantity of well-known brands of cut
nails, in lots and sizes to suit. State quantity and
sizes wanted, and address

NAILS, Box 1169,
New Haven, Conn.

WANTED.

Iron Planer, 36 x 36 in. x 8 feet.
Pulley, 54 x 24 in., 3 in. bore.
Machine Shop 5-ton Crane.

FOR SALE.

12 x 24 in. Engine, Fly Wheel 8 x 2 feet; been in
use about two years. Can be seen running at
THE STILES & PARKER PRESS CO.,
Middletown, Conn.

To Capitalists and others Seeking
Manufacturing Sites.

The Parnassus, Pa., Industrial Association offers
liberal inducements in land and cash to parties
who will locate manufacturing establishments in
their town. Natural Gas, Coal and Iron Ore in
immediate vicinity. Address

PARNASSUS INDUSTRIAL ASSOCIATION,
Parnassus, Westmoreland Co., Pa.

For Sale.

Stock of hardware, stoves and implements, and
store furniture, in one of the best towns in Kansas.
Address

HARDWARE,
Box 466, Salina, Kansas.

For Sale.

Engine and Boiler, 35-horse power.
Shafting, Pulleys, &c.
Steam Hoisting Apparatus.
Also, a complete set of R. R. card making ma-
chinery.
Apply to

GEORGE BAILEY,
290 Pearl Street, Buffalo, N. Y.

For Sale.

The valuable Iron Ore property of the Wayne
County Mining Company, situated in Wayne Co.,
N. Y., on the line of Lake Shore division of Rome,
Watertown & Ogdensburg R. R., with tracks and
branches leading to the mines. This property ex-
tends over four miles along said road, and nowhere
over half a mile from it, and contains over two
millions of tons. It is now in full operation and
shipping from 100 to 200 tons per day, and is cap-
able of doubling that amount. It is only 17 miles
from port of Genesee, one of the best harbors on
Lake Ontario, with ample dock room for shipping
by lake. For further particulars, address

J. E. ELLIOTT, Sec'y,
Clinton, Oneida Co., N. Y.

PARTIES desiring to manufacture Fire Brick
and Pottery can secure a location on the
line of the Erie Railroad. Water abundant,
fuel and material cheap. Freight to tide water,
\$.00 per ton; to Richmond and Petersburg, \$1.50
per ton. Good local demand. Product can be de-
livered on Chesapeake and Ohio, Richmond and
Alleghany, and Atlantic Coast Line without break-
ing bulk.

JAMES R. WUTH, Sup't and Treas.,
Richmond, Va.

AGENTS WANTED to sell the Hardware
Trade, Jobbers, Retailers and Exporters a
standard article, which commands a ready sale.
Commission liberally given. U. S. D.
dress, stating ground covered, U. S. D.
Office of The Iron Age, 83 Reade St., New York.

Trade Report.

OFFICE OF THE IRON AGE.

WEDNESDAY EVENING, April 28, 1880.

The financial markets have been only
moderately active during the past week.
The bonds offered to the Treasury for the
Sinking Fund, to-day, amounted to \$7,835,-
400. Of these \$3,000,000 were accepted.

The importations of specie and bullion for
the week ending April 23 amount to \$135,055,
including \$12,152 gold and \$122,903 silver.
Since the 1st of January the importations
will reach \$2,992,189, consisting of \$1,208,-
051 gold, \$1,783,119 silver and \$1019
brass and copper coin. From the 1st
of August, 1879, to April 23, 1880, there
has been a total importation of \$80,999,851,
of which \$76,467,332 is gold and \$4,532,519
silver.

Money has been easy, the rate for call
loans having fluctuated between the limits
3% and 6%.

Government bonds have been strong, and
such changes as have occurred have been
for the better. Railroad bonds have been
strong and generally higher.

There has been less activity in the stock
market, and prices have been alternately
strong and heavy. Until Monday afternoon
they were generally strong, but after that
they weakened and continued weak to the
close. The principal dealings were in Erie,
Pacific Mail, Ontario and Western, Wabash
and Pacific, Western Union Telegraph and the
Coal stocks.

The bank return shows a gain of \$1,654,-
675 in reserve, which now stands at \$2,191,-
525, against \$12,324,050 at this time last
year, and \$17,300,150 at the corresponding
period in 1878. The loans show a loss this
week of \$5,364,600, the specie is down \$1,-
067,200, the legal tenders are increased \$1,-
566,100, the deposits other than United
States are down \$4,023,100, and the circula-
tion is decreased \$230,200.

The following is an analysis of the bank
totals of this week compared with that of
last week:

	April 17.	April 24.	Comparisons.
Loans.....	\$24,250,800	\$27,886,200	Dec. \$3,635,400
Specie.....	50,050,800	48,983,600	Dec. 1,067,200
Legal tenders	13,666,000	15,432,100	Inc. 1,766,100
U. S. notes	53,090,800	61,415,700	Inc. 8,324,900
Deposits.....	253,519,800	248,896,700	Dec. 4,623,100
Reserve re- quired.....	63,379,050	62,224,175	Dec. 1,154,875
Surplus.....	236,850	2,191,525	Inc. 1,954,675
Circulation..	20,843,000	20,612,800	Dec. 230,200

The foreign trade movements at the port
of New York since our last issue are shown
in the following tables:

IMPORTS.

	1878.	1879.	1880.
Dry goods.....	\$1,399,783	\$1,631,701	\$2,104,469
General mids..	4,459,335	5,572,232	8,605,373
Total for week.	\$5,859,118	\$7,203,933	\$10,709,842
Prev. reported..	20,793,995	28,615,307	34,632,189

Since Jan. 1....\$90,633,114 \$95,355,350 \$137,201,031
Included in the imports were items of
merchandise valued as follows:

	Quantity.	Value.
Anvils.....	171	\$1,608
Brass goods.....	35	6,412
Bronzes.....	24	5,768
Chains and anchors.....	45	2,641
Copper.....	15	2,641
Cutlery.....	109	27,065
Guns.....	173	39,754
Hardware.....	25	2,334
Iron, hoop, tons.....	449	22,185
Iron, pig, tons.....	7,092	150,741
Iron, sheet, tons.....	230	20,734
Railroad bars.....	2,412	18,323
Iron cotton ties.....	3,562	22,185
Iron ore, tons.....	18,821	150,741
Iron, other, tons.....	14,407	401,887
Lead, pigs.....	17,529	4,802
Metal goods.....	20	27,072
Nails.....	10	2,172
Needles.....	11	11,380
Nickel.....	29	5,119
Old metal.....	1	5,119
Plated ware.....	14	1,546
Percussion caps.....	15	2,585
Saddlery.....	13	101,899
Steel.....	13,637	101,899
Spelter.....	13	513
Silverware.....	7	299,016
Tin, bxs.....	42,214	84,118
Tin, 630 slabs; lbs.....	404,809	15,645
Wire.....	7,700	474
Zinc.....	7,700	474

EXPORTS, EXCLUSIVE OF SPECIE.

	1878.	1879.	1880.
For the week....	\$5,676,321	\$5,995,487	\$8,196,954
Prev. reported..	101,881,135	99,974,502	100,187,454
Since Jan. 1....	\$107,557,456	\$6,480,889	108,384,408

EXPORTS OF SPECIE.

	For week ended April 10:
Total for the week.....	\$47,280
Previously reported.....	3,028,897
Total since January 1.....	\$3,116,177

Government bonds at the close were strong
at the following quotations:

	Bid.	Asked.
U. S. 6's 1880 registered.....	104 1/4	104 3/4
U. S. 6's 1880 coupon.....	104 1/4	104 3/4
U. S. 6's 1881 registered.....	104 1/4	104 3/4
U. S. 6's 1881 coupon.....	104 1/4	104 3/4
U. S. 5's 1881 registered.....	103 1/4	103 3/4
U. S. 5's 1881 coupon.....	103 1/4	103 3/4
U. S. 4 1/2's 1881 registered.....	102 1/4	102 3/4
U. S. 4 1/2's 1881 coupon.....	102 1/4	102 3/4
U. S. 4's 1897 registered.....	107 1/4	107 3/4
U. S. 4's 1897 coupon.....	107 1/4	107 3/4
U. S. Currency 6's 1895.....	125	125
U. S. Currency 6's 1897.....	125	125
U. S. Currency 6's 1898.....	125	125
U. S. Currency 6's 1899.....	125	125

The following were the closing quotations
of active shares:

	Bid.	Asked.
American District Telegraph.....	77 1/2	77 3/4
Boston Water Power.....	115	115 1/2
Burlington and Quincy.....	12 1/2	12 3/4
Canada Southern.....	6 1/4	6 1/2
Caribou.....	6	6 1/2
Col. Chicago and Indiana Central.....	14 1/2	14 3/4
Clev. Col. Cin. and Indianapolis.....	76	76 1/2
Cleveland and Pittsburgh.....	113	113 1/2
Chicago, St. Paul and Minn.....	57 1/2	57 3/4
Chicago and Alton.....	127	127 1/2
Central Pacific.....	72	72 1/2
Delaware, Lack. and Western.....	85 1/2	85 3/4
Delaware & Hudson Canal.....	79 1/2	79 3/4

Express-Adams.....	111 1/2	112 1/2
" American.....	58	59
" United States.....	47 1/2	48 1/2
" Wells, Fargo & Co.....	107	107 1/2
Erie.....	42 1/4	42 3/4
" Pref.....	64 1/2	65
Hambal and St. Joseph.....	34	34 1/2
" Pref.....	71 1/2	72
Homestake.....	33	35
Houston and Texas.....	69 1/2	70
Illinois Central.....	104 1/2	105
Kansas and Texas.....	104 1/2	105
Lake Erie and Western.....	107 1/2	107 3/4
Lake Shore.....	107 1/2	107 3/4
Little Pittsburgh.....	5 1/2	5 3/4
Louisville and Nashville.....	137 1/2	138
Metropolitan Elevated.....	97	98
Michigan Central.....	97	97 1/2
Morris and Essex.....	105	106
Nashville and Chattanooga.....	19 1/2	19 3/4
Manhattan Railway.....	74 1/2	75
New York Central.....	130	130 1/2
New York Elevated.....	112	114
New Jersey Central.....	76	76 1/2
Northwest.....	93 1/2	94
" Pref.....	109	109 1/2
Northern Pacific.....	28	28 1/2
Ohio and Mississippi.....	34	34 1/2
" Pref.....	73	74
Ontario Silver.....	34	35
Ontario and Western.....	29 1/2	30
Pacific Mail.....	40 1/2	40 3/4
Quicksilver.....	12	12 1/2
" Pref.....	60	60 1/2
Reading.....	18 1/2	18 3/4
Rock Island and Pacific.....	18 1/2	18 3/4
Silver Cliff.....	4 1/2	4 3/4
St. Louis and Iron Mountain.....	49 1/2	49 3/4
St. Louis and San Francisco.....	34 1/2	34 3/4
" Pref.....	60	60 1/2
St. Paul.....	77 1/2	77 3/4
" Pref.....	101 1/2	101 3/4
St. Paul and Sioux City.....	42 1/2	42 3/4
Standard.....	29	29 1/2
Union Pacific.....	87 1/2	87 3/4
Wabash and Pacific.....	38 1/2	38 3/4
" Pref.....	67	67 1/2
Western Union Telegraph.....	105 1/2	105 3/4

GENERAL HARDWARE.

We have still to report a very quiet mar-
ket, although from the retail trade of the
country an improvement in the demand is
being experienced. So far as values are
concerned there is little to be said; man-
ufacturers continue firm in their views, and
although there are rumors of shading of
prices, they cannot be traced to a reliable
source. Present appearances indicate that
if any changes in values occur it is not likely
they will be made before the opening of the
fall season.

A slight improvement is reported in the
demand for Nails this week, but the orders
we hear of are only for small lots for local
requirements. In regard to price the mar-
ket is in a very unsettled state, and although
the nominal figure is \$5 for rod, to 60d., still
we hear of considerable shading, and have
no doubt that for a fair sized order \$4.50
would be accepted.

The Western Nail Manufacturers' Association
held a meeting in Pittsburgh to-day,
at which it was agreed that the Nail mills,
which have been idle for several weeks,
should resume work on Monday next. The
card rate was reduced to the basis of \$4
for rod.

Since our last writing the manufacturers of
Iron Wire have made some important re-
ductions in their prices. The revised dis-
counts will be found under the heading of
"New York Wholesale Prices" on another
page.

We have received the following:
On and after the 26th of April, 1880, the
price of Dover Egg Beaters will be \$24 per
gross, net. Less than one gross, \$2.50 per
dozen.

DOVER STAMPING CO.

We have received the following notices of
removal:
The Passaic Rolling Mill Company, of
Paterson, N. J., have removed their New
York office to room 45, Astor House.

Henry B. Newhall has removed from his
old stand, No. 11 Warren street, to No. 105
Chambers street.

The Union Manufacturing Company have
removed their warehouse in this city from
No. 98 to No. 96 Chambers street.

The Branford Lock Works have moved to
No. 103 Chambers street.

C. E. Jennings & Co. have moved to No.
96 Chambers street.

Maltby, Curtis & Co. have moved from
No. 34 Reade street to No. 98 Chambers
street.

Martin Doscher, agent for G. W. Brad-
ley's Edge Tools, has removed to No. 85
Chambers street.

On May 1 the New England Butt Com-
pany will remove their warehouse in this
city from No. 30 Platt street to No. 99
Chambers street.

The attention of the trade is invited to
the advertisement of the Norris Pulley, on
page 22. The manufacturers write us that
"these pulleys have met with a large sale
everywhere, and are extensively used by all
the leading sash and blind factories in the
country. The saving in time is so great
that a mill cannot afford to be without them,
and in connection with a hand gauge for
carpenters, made by us, they are coming into
general use." These pulleys are manufac-
tured in all sizes and various styles of finish,
and, we are informed, cost no more than an
ordinary Frame Pulley.

We invite attention to the advertisement
of "Ajax, Jr.," and "Hebe" Lawn Mowers,
on the 20th page. These goods are man-
ufactured by L. Wilder, Hoosick Falls, N. Y.,
and are sold in this city by Leonard &
McCoy, No. 118 Liberty street.

Some time ago we mentioned the fact of
the amalgamation of the leading Screw man-
ufacturers in England into one large cor-
poration, to be known as Nettlefolds, Limited.
The following particulars of the organiza-
tion of the company will be interesting to
many of our readers:

INCORPORATED UNDER THE COMPANIES ACT, 1862
1879. Capital, £1,000,000, in 75,000 shares of £10
each.
Directors—Sir Henry Nettlefolds, Birming-

ham, chairman and managing director; Freder-
ick Nettlefolds, London; Alfred Field, Birming-
ham; Thomas Gladstone, Birmingham; John
Thewlis Johnson, Manchester; Sampson Zachary
Lloyd, Stourport.

Bankers—The Birmingham Joint Stock Bank,
Limited, the London Joint Stock Bank; Man-
chester and County Bank, Limited, Solicitors—
Messrs. Ryland, Martineau, Carslake and Good-
win, 7 Cannon street, Birmingham. Auditors—
Messrs. Carter and Carter, Waterloo street, Bir-
mingham. Secretary—Reginald Parker.

This company has been formed for the purpose
of acquiring from their several proprietors the
various manufacturing works mentioned be-
low, with the businesses carried on there, and all
the patent rights, machinery and trade property
belonging to such businesses, namely:

1. Messrs. Nettlefolds—Freehold Works at Heath
street, Birmingham, and Cranford street, Smeth-
wick for the manufacture of Wood Screws, Wire
and other articles, with adjoining land. Free-
hold Works at King's Norton, Worcestershire, for
the manufacture of Wood Screws and other arti-
cles. Leasehold Works, warehouses and offices in
Broad street and Atwood Passage, Birmingham.
Leasehold Wire Works in Princip street, Birming-
ham. Freehold Works at Hadley, Shropshire, known as the Caston Iron Works.

2. The Birmingham Screw Company, Limited—
Freehold Works at Smethwick (for the manufac-
ture of Wood Screws), and adjoining property.

3. The Manchester Steel Screw Company, Lim-
ited—Freehold Works at Bradford, Manchester, for the manufacture of Screws.

4. Mr. John Cornforth—Leasehold Wire and
Wire Nail Works, in Berkeley street, Birming-
ham.

5. Messrs. Lloyd & Harrison—The Screw busi-
ness carried on at Stourport.

For the above purposes the company has been
registered with a share capital of £750,000, divided
into 75,000 shares of £10 each. It is not intended,
in the first instance, to issue more than 65,000 of
these shares; 10,000 of the shares to be so issued
will be preference shares, bearing a fixed cumu-
lative dividend of

Lead.—The present aspect of the Lead market is the reverse of cheerful, there being much pressure exercised on it by parties out West wishing to create a decline here, and not without success, favored as this attempt is, moreover, by cable news from Europe to the effect that the tendency there has also become a downward one once more, probably by the failure of the so-called speculative syndicate in trying to bolster up prices. If these luckless syndicates would but leave the metals alone and allow them to settle down upon a sound basis at this juncture, they would confer a singular favor upon the metal trade. It is most essential just at present that the metals should stand on their own merits. Everybody is aware that the late so-called revival has proved a dead failure, so far as metal values are concerned, and that all speculation for a rise is doomed to disappointment while such is the sentiment of Europe and America. Sales have been effected slowly here, being confined to a small jobbing trade at 5.40¢ for Common Domestic, and 5.50¢ for Refined. In the latter nothing has transpired. German production last year has been 3 per cent. in excess of 1878, proving to have been 74,000 tons of Pig Lead. Manufacturers of Lead remain unchanged. We quote: Sheet Lead, 9¢; Pipe, 8½¢, and Tin-lined Lead, 15¢, less the usual discount to dealers.

Spelter and Zinc.—Nothing has transpired; the market is dull, and we quote both Common Domestic and Silesian, 6½¢. There have been produced in Germany 97,000 tons of Spelter in 1879, showing an increase of about 12 % over 1878. Sheet Zinc is nominal.

Nickel.—There has been no change; a moderate demand prevails at \$1.50 for Prime American.

Antimony.—We have relapsed into dullness here. We quote at the close, Cookson, 23¢ @ 23½¢, and Hallett and Johnson, 18¢ @ 18½¢.

COAL.

The market for the present week shows little change from that of last week. The suspension does not seem to have had any perceptible effect, in spite of the hopes of the companies. One of the strongest bull reports, which was published on the 26th, says that the market is hardly as active as was hoped for before the suspension. This, we think, a very strong admission. Dealers in and around New York city are buying from hand to mouth, preferring to wait and run the risk of a turn in the market. During the week there has been very little inquiry for Coal, and that which has been sold has, in a large proportion of cases, been shaded. The small Coals—No. 2 Chestnut and Buckwheat—are brisk, being taken for manufacturing purposes. The large Coals are in pretty fair demand, though we hear that there is some cutting, even on manufacturing sizes. The companies, so far as can be learned, are holding strictly to circular rates, but the outsiders are "giving the usual commissions," which is, in plain language, cutting prices to almost every one. Stove, while nominally \$4, is reported to be obtainable at \$3.75. Circular prices are probably shaded at from 10¢ to 25¢ per ton, according to the customer and the dealer. There is a strong talk among the companies of a continued suspension in May, not so much to reduce the quantity as to show buyers that the companies mean to control the market and ask such prices as they choose. Just now there is some difficulty in deciding whether it shall be a three-day-per-week suspension during the whole month, or a week or two total suspension at the close.

The Philadelphia Ledger says: "It is intended, however, that no advantage shall inure to consumers from lessened production, and Coal which is not ordered and shipped now because of the prices, producers propose to hold at higher prices as the season shortens and crowd more tonnage into a few weeks late in the season." In spite of this very strong language, one of the most experienced and careful dealers in New York advises his manufacturing customers to wait, and buy from hand to mouth as occasion may render necessary. He also says that, while there may be a break, it is not likely that there will be an advance. This shows both sides of the case. It is hardly needful to add that consumers seem to be following the waiting plan. The regular quotations are the same as last week, the free-burning Lump, Grate and Egg ranging about \$4; Lehigh Lump, \$5 @ \$5.25; Lehigh Grate and Egg, \$4.25; Lehigh Stove and Chestnut, \$4.

Freights are unchanged. Rhode Island, 90¢; Boston, \$1; with Portland about 75¢ and discharged. There is still a scarcity of vessels for Sound ports, with an abundance for places where return ice freights can be obtained.

OLD METALS, PAPER STOCK, &c.

We have nothing new to report in the Old Metal market this week, and our quotations are but slightly changed since our last writing. The Rag and Paper Stock market continues weak. There is too much stock offered and no buyers.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy.....	14.18 @	15.00 @
Copper Bottoms.....	14.14 @	15.00 @
Yellow Metal.....	13.00 @	14.00 @
Brass, heavy.....	12.00 @	13.00 @
Brass, light.....	11.00 @	12.00 @
Composition, heavy.....	10.00 @	11.00 @
Lead, heavy.....	10.00 @	11.00 @
Tea Lead.....	10.00 @	11.00 @
Zinc.....	10.00 @	11.00 @
Pewter, No. 1.....	10.00 @	11.00 @
Pewter, No. 2.....	10.00 @	11.00 @
Wrought Iron.....	10.00 @	11.00 @
Light do.....	10.00 @	11.00 @
Stove Plate.....	10.00 @	11.00 @
Machinery do.....	10.00 @	11.00 @
Grate Bars.....	10.00 @	11.00 @

The prices current for Rags, &c., are as follows:

Canvas, Linen.....	4.00 @	4.50 @
White Cotton.....	4.00 @	4.50 @
White, No. 1.....	4.00 @	4.50 @
White, No. 2.....	4.00 @	4.50 @
Second.....	4.00 @	4.50 @
Soft Woollens.....	4.00 @	4.50 @
Mixed Rags.....	4.00 @	4.50 @
Gunny Bagging.....	4.00 @	4.50 @
Jute Butts.....	4.00 @	4.50 @
Kentucky Bagging.....	4.00 @	4.50 @

Book Stock..... 3½¢ @ 4.00 @
Newspapers..... 3½¢ @ 4.00 @
Waste Paper and Scraps..... 3½¢ @ 4.00 @
Kentucky Bale Ropes..... 4.00 @

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending April 27, 1880:

Hardware.
Allen & Nixon, Hdw., cs., 3
American Screw Co. Mds., pgs., 1
Anthony E. & H. T. Hdw., cs., 6
Arango A. Safe door, 1
Barber Bros. & Co. Tele. wire, coils, 252
Bloomfield J. C. & Co. Hdw., bds., 147
Mds., pgs., 8
Baker, Hermann & Co. Hdw., and cutlery, pgs., 20
Borely E. Machinery, cs., 2
Drexel, Morgan & Co. Hdw., cs., 1
Early & Lane, Hdw., cs., 46
Eccleston Wm. Hdw., pgs., 19
Field Alfred & Co. Cartridge cases, cs., 13
Folsom H. & D. Arms, cs., 35
Geswein T. W. Hdw., case, 1
Graef Cutlery Co. Mds., pgs., 2
Hartley & Graham, Mds., pgs., 17
Helm, cs., 3
Heller & Losen, Hdw., cs., 1
Hopkins E. T. Files, cs., 3
Irwin T. & Sons, Chis., cs., 115
Livingstone, W. & F. Grindstones, 2047
Lockwood A. J. Files, cs., 6
Low C. A. Machinery, case, 1
Marr & Co. Wire, cs., 15
Mason John W. & Co. Wire rope, reel, 1
McCoy & Co. Wire rope, coils, 2
Merchants Dispatch Co. Gun caps, cs., 5
Moore J. P. & Sons, Gun caps, cs., 6
Mullin P. Guns, case, 1
Pieron & Co. Wire, bds., 488
Rogers H. Mds., pgs., 7
Schoverling, Daily & Co. Mds., pgs., 5
Spannoch Bros. Rifles, cs., 2
Stearns John N. & Co. Machinery, cs., 4
Supt. French Cable, Tel. material, case, 1
Tillotson L. G. & Co. Wire, coils, 754
Upson, Walton & Co. Wire rope, coils, 18
Von Cleff & Co. Mds., pgs., 8
Wetzlar M. Mds., pgs., 3
Wierwille & Hilger Hdw. Co. Cutlery and hdw., pgs., 35
Winchester Arms Co. Mds., pgs., 1
Rifles, cs., 10
Witte J. G. & Bros. Mds., pgs., 4
Wolf H. & Co. Order, 1
Cannel coal, cs., 1
Coal, tons, 649
Grindstones, 34
Hdw., bds., 12
Horton coal, cs., 118
Nails, kegs, 100
Shot, cs., 3
Wire, bds., 2575
Wire net, rolls, 66

Iron.

Abbott Jere & Co. Flat wire rods, bds., 15
Abeel Bros. Bars, 2543
Abraham M. & Co. Pig, tons, 500
Bank of N. Y. National Banking Association, Hoops, bds., 35,650
Baring Bros. & Co. Bars, 4147
Boxes, 160
Scrap, tons, 1311½
Pig, tons, 520½
Wire rods, bds., 6397
Rods, pgs., 1113
Old anchors, 17
Baker, Hermann & Co. Spiegel iron, tons, 300
Brown Bros. & Co. Bars, 13,903
Bundles, 460
Carter H. & A. Old rails, kilos, 98,760
Wrought scrap, kilos, 312,001
Cary & Moen. Wire rods, bds., 817
Coddington J. T. B. & Co. Sheet iron, bds., 138
Crowell & Co. Bar iron, bds., 404
de Mill H. R. Sheet iron, bds., 352
Drexel, Morgan & Co. Wrought scrap, tons, 2500
Henderson James. Old rails, tons, 40
Hopkins Edward F. Taggers, bds., 107
Irwin, Richard & Co. Pig, tons, 1250
Janzen J. A. & Co. Pig, two lots
Scrap, a quantity
Tons, 50
Lee Jas. & Co. Pig, tons, 420
Luckmann Matthews & Co. Old iron, tons, 98½
Lundberg Gustav. Coils, 1075
Bundles, 416
Mayer Bros. & Co. Old rails, 1500
Morgan J. S. & Co. Pig, tons, 200
Morton, Bliss & Co. Bars, 2130
New rails, 2498
Moses & Cohen. Old iron, cs., 4
Old iron, tons, 32½
Mosler Bros. Old anchors, 2
Netherland Trading Society. Old rails, tons, 107
Old iron, tons, 733
Nevada Bank of San Francisco.

Metals.

Ackerman J. H. & Co. Antimony, cs., 22
Agostini J. Old copper, bds., 2
Baring Bros. & Co. Tin plates, bds., 1494
Tin, slabs, 1381
Bruce & Cook. Tin plates, bds., 995
Byrnes, Jos. & Co. Tin plates, bds., 719
Canadian Bank of Commerce. Tin, slabs, 440
Cort N. L. & Co. Tin plates, bds., 67
Harley Geo. Zinc, bales, 17
Hazen & Billings. Lead, bars, 1495
Laidlaw & Co. Lead, bars, 649
Mallard H. Tin foil, cs., 2
McCoy & Co. Nickel, cs., 9
Meyer Morris. Lead, bars, 6200
Moele Bros. Type, bxs., 9
Nederlandsche Handelsbank. Tin, slabs, 403
Pheips, Dodge & Co. Tin plates, bds., 1839
Taggers, bds., 107
Regulus antimony, cs., 50
Pratt C. & Co. Tin plates, bds., 310
Progresso Mexico, For. Tin plates, cs., 20
United States Stamping Co. Tin plates, bds., 212
Watson Chas. & Co. Granulated nickel, bds., 2
Order. Antimony, cs., 66
Lead, pgs., 2043
Magnesia, cs., 116
Regulus antimony, cs., 39
Spelter, plates, 16
Tin, bds., 5
Tin, ingots, 5709
Tin plates, bds., 38
Tin slabs, 5112
Zinc, bds., 23

Steel.

Baring Bros. & Co. Coils, 30
Collier, 30
Blake Bros. & Co. Bundles, 260

Brown Wm. Bundles, 226
Brown Bros. & Co. Blooms, 1339
Brown, Shipley & Co. Bundles, 1164
Cary & Moen. Wire rods, bds., 678
Lockwood A. J. Old rails, tons, 153
Bundles, 161
Cases, 3
Prosser Thos. & Sons. Packages, 195
Bundles, 60
Wolff, Kahn & Co. Packages, 684
Woodford W. O. Bars, 87
Bundles, 749
Cases, 42
Order. Bessemer steel, cs., 10

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending April 27, 1880:

Hamburg.
Sew. mach., cs. 670 \$14,628
Lab. oil, bbls. 90 651
Hdw., cs. 97 4,255
Silverware, cs. 2 3,000
Pumps, pgs. 7 1,705
Belting, cs. 3 1,235
Ptm., gals. 13,250 3,134
Sew. ma., cs. 830 11,417
Ag. imp., pgs. 62 6,716
Iron pipes, No. 992 4,900

Bremen.
Ptm., gals. 667,316 76,300
Hdw., cs. 12 12,605
Mach'y, case, 1 150
Lab. oil, bbls. 60 574
Sew. ma., cs. 830 11,417
Mf. iron, pgs. 68 2,970
Nails, bxs. 5 95

Antwerp.
Tel. mls., pgs. 8 343
Mf. iron, pgs. 24 40
Lab. oil, gals. 2462 616
Stove mls., pgs. 3 55

Cronstadt.
Ptm., gals. 100,000 12,500

Danzig.
Ptm., gals. 24,601 3,800

Rotterdam.
Pumps, pgs. 7 342
Lab. oil, bbls. 60 574
Hdw., cs. 97 4,255
Mach'y, case, 1 150
Ag. imp., pgs. 33 2,641
Sew. ma., cs. 830 11,417

London.
Ptm., gals. 100,633 9,441
Mdw., pgs. 444 15,291
Hoops, bds. 1593 308
Sew. ma., cs. 125 2,450
Pumps, pgs. 4 356
Cartridges, cs. 4 3952
Handspikes, 350 108
Lab. oil, bbls. 1110 10,344
Glassware, pgs. 73 1,305
Mach'y, pgs. 77 3,926
Ag. imp., pgs. 81 978
Wire, pgs. 125 1,266

British North American Colonies.
Coal, tons, 160 600

British West Indies.
Tinware, cs. 3 50
Nails, kegs, 11 66
Glassware, cs. 45 346
Mf. iron, pgs. 160 66
Ag. imp., pgs. 124 1,244
Coal, tons, 75 308
Ptm., gals. 24,451 2,796
Mdw., cs. 41 671

British Guiana.
Ptm., gals. 5000 600

Iron safe..... 1 350
Mach'y, cs..... 2 300
Gas fixtr., cs..... 1 61

Dutch East Indies.
Ptm., gals. 732,320 83,867

Havre.
Ptm., gals. 4 260
Ag. imp., pgs. 377 12,200
Lab. oil, bbls. 171 1,011
Mach'y, cs. 6 925

Marseilles.
Ptm., gals. 204,524 15,694

Dunkirk.
Ptm., gals. 164,300 12,332

French West Indies.
Ptm., gals. 5000 600

Seville.
Ag. imp., pgs. 4 50
Ptm., gals. 49,000 5,300

Cadiz.
Hdw., cs. 4 70

Brasil.
Sew. ma., cs. 42 1,116
Glassware, cs. 26 485
Nails, kegs, 30 1,475
Ptm., gals. 60 1,774
Hdw., cs. 9 490

Cuba.
Glassware, cs. 93 1,667
Sew. ma., cs. 351 3,144
Machinery, cs. 28 1,648
Tinware, cs. 3 79
Mach'y oil, gals. 2630 755
Sandpaper, cs. 40 40
Tin plate, bds. 10 70
Belting, cs. 1 138
Grindstones, 50 31

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., Philadelphia, April 27, 1880.

Pig Iron.—The market continues exceedingly dull and prices still show a downward tendency. Standard makes seem to be in light supply, and as remarked last week, it would be a difficult task to secure these in

quantity at any price. Hence the anomalous condition of the market, the largest producers having little or nothing to offer, nobody wanting to buy, and yet good iron almost going begging at \$4 or \$5 per ton below nominal quotations. The explanation of this may, no doubt, be found by a careful study of the "Condition of the Blast Furnaces in the United States, April 1st, 1880" shown in last week's *Iron Age*. Compared with the previous year, there are 180 anthracite furnaces in blast, 140 bituminous and 102 charcoal—a total increase of 100 furnaces, or about the same as compared with the average of 1877-8-9. This, at the low estimate of 150 tons output per week for each furnace, represents an increased production, for three months, of 357,000 tons, to which may be added the 232,523 tons of Pig Iron imported, giving during the first three months of 1880 an increased supply of 590,023 tons. This amount, large as it is, is not all, as there are 100,000 tons old iron and 90,000 tons rails, bars, sheets, &c., to be added to the importations, making a grand total of 780,000 tons in excess of the corresponding periods in 1877 '78 or '79. These are facts which cannot be ignored. The increase in consumption is no doubt very large, and may possibly receive a fresh impulse at the lower prices. Many large consumers declared that at \$40 for Pig Metal and its equivalent for Finished Iron, business was seriously curtailed; it may, therefore, be fairly expected that at 25 or 30 per cent. reduction, orders will crowd in upon them again. So far as we can learn there is not a single feature less favorable in the general outlook than there was during the "boom." The volume of legitimate business is quite as large as it was some time ago. Railway earnings show a steady gain, notwithstanding the large increase during the early part of last year. The abundant crops of last year have found ready sale for export. Grain, Cotton and Provisions have sold at a considerable advance as compared with previous years. Immigration bids fair to equal former years. In every direction, and without a single exception, there are indications of prosperity. The decline in iron, therefore, is not due to any general depression or falling off in business, but is a natural reaction from inflated values. The Iron trade may be unsettled for awhile, and, owing to heavy supplies, prices may temporarily be unprofitable, but there is no reason to anticipate long-continued demoralization. The capacity for production is evidently quite equal to the capacity for consumption, and Iron will have to be made and sold at prices sufficiently low to prevent importations. This fact has been clearly established, and all attempts to maintain prices at a higher level than that of foreign must inevitably result in failure. The present unsettled condition of the market may be attributed solely to this cause, and before business resumes its normal condition the half million tons or upward of foreign Iron will have to be got out of the way. Under these circumstances buyers are timid, and those having Iron to sell from furnaces recently started are specially anxious to find a market. As before mentioned, standard brands appear to be scarce, and held at comparatively high figures; but the remarks made in this column on March 18, when prices were several dollars per ton higher, may again be quoted as indicating the probable course of the market, viz.: "The increasing supply of outside lots, both foreign and domestic, is bound to tell in the long run, and although the shrinkage at present is chiefly confined to these, it is not likely that the more favorite brands can hold their price against competition of this character." The large surplus of iron above referred to, as coming on the market during the first quarter of 1880, is not likely to extend in like proportion much further, and it is not improbable that it may represent something near the surplus for the whole year. Importations must necessarily fall off, while production is not likely to be increased, but may fall off somewhat. Cost of production will be lessened; ores are already 20 to 25 % lower, and it is reported that quite a reduction is to be made in fuel. Hence the settling down in prices should be regarded as precautionary, and ultimately will, no doubt, be for the best interests of all concerned. It will keep out foreign iron, stimulate consumption, keep our furnaces employed, and at the same time enable the mills to produce finished iron at prices lower than the foreign article would cost. To give any definite idea of the market by quotations is impossible, as there is no certainty how low sellers would go, providing they could secure desirable orders. Small lots have sold at the following figures, at which we quote the market quiet and nominal: No. 1 Foundry Iron, \$28 @ \$30; No. 2 Foundry Iron, \$27; Gray Forge, \$25 @ \$28; Bessemer Iron, \$28 @ \$30; Scotch offered at \$23 @ \$24, with sales of small lots; Glengarnock, \$24; Gartsherrie, \$25; Charcoal Iron dull and nominal, \$45 @ \$50.

Blooms.—Are dull and again lower and offered at the following rates, viz.: Charcoal Blooms, \$92.50; Run-out Anthracite, \$77.50; Sunken Scrap Blooms, \$67.50; Northern Ore Blooms, \$62.50.

Muck Bars.—There is no demand whatever. Sales have been made in a small way at \$52.50, with more offered at the price without meeting with buyers.

Structural Iron.—There has been more inquiry during the week, and the outlook is more favorable so far as the demand is concerned. We cannot learn that actual orders have been entered of special importance, although consumption is large. The demand for Angles has been somewhat interfered with by the offerings of foreign manufactures, and this for a time may be expected to continue until stocks are used up. Prices are a shade lower, but steady, at 3.3¢ @ 3.4¢ for Angles, and 3.6¢ @ 3.7¢ for Beams, Channels and Tees. Foreign Angles sold to day at 3¢ from stock. Mill orders entered in quantity at 3.4¢.

Plate and Tank Iron.—There has been more business doing in this department and the outlook is improving. Prices are lower in proportion to other descriptions, but orders given and inquiries for other lots indicate continued large consumption. We repeat last week's quotations, although orders for large lots have been taken

at a reduction of \$5 per ton and upward. For small lots we quote: Tank and Common Plates, 3.3¢ @ 3.5¢; C. No. 1, 3.75¢; C. H. No. 1 Shell, 4¢; Flange, 5½¢; Best Flange, 6¢; Fire-Box, 6½¢; Solid Bloom, 8¢ @ 8½¢.

Sheet Iron.—There is more inquiry, and somewhat larger sales than for some time past, although business is by no means active. Prices are a shade firmer, and holders are not disposed to make concessions unless for a specially desirable order. It is not unlikely that bottom has been reached in this branch of the Iron trade. The following quotations fairly represent the market:

Common Sheet, No. 28 to 28..... 53¢
Common Sheet, No. 28 to 28..... 53¢
Common Sheet, No. 16 to 21..... 53¢
Best Refined ¼ @ ½ advance on the above.
Best Bloom Sheets, No. 26 to 28..... 8 ¢
Best Bloom Sheets, No. 26 to 28..... 7½¢
Best Bloom Sheets, No. 16 to 21..... 7½¢
Common Red Plates, 3-16 to 16..... 3-9¢
Blue Annealed, 3-16 to 16..... 4-9¢
Best Bloom Galvanized, discount..... 30 ¢
Second quality, discount..... 30 ¢

Bar Iron.—This department of the Iron trade continues dull, and buyers do not yet appear to have confidence in values. Prices have been reduced to 3¢, and although it is possible there may be some further shrinkage, it is generally regarded that present quotations, if not bottom, are not far from it. The decline in Pig metal, for several reasons, ought not to be considered a fair measure of what reduction there should be in Finished Iron. In the first place, Bars did not advance in the same proportion, and in the next place, at less than 3¢ B. B. there is not the same danger of competition with foreign Iron. Pig Iron, with a tariff of 7¢ per ton, stands in a different position to Merchant Iron at \$22 per ton. Neither is the capacity for production in the same proportion as that of Pig Metal. Considering, therefore, that consumption promises to be as large as ever, there appears to be good grounds for assuming that prices cannot go much lower unless in sympathy with decline in raw material. At present, however, orders come in very slowly, but for the reasons given it seems safe to assert that values are rapidly approaching a solid and safe basis. Meantime we quote 3¢ from mill and store, with a little shading on large orders.

Steel Rails.—It is difficult to get at the exact condition of the rail trade, although a good deal of business has been entered since date of our last report. Sales to a very considerable extent are reported at about \$75 at mill, but these figures would be shaded for deliveries to suit sellers' convenience. Foreign rails are quoted at \$70, with transactions at something below that figure. Probably \$68 @ \$70 for foreign, and \$72.50 @ \$75 for American, would be fair quotations at this date.

Iron Rails.—There has been quite an active inquiry, and sales to a fair extent. One lot of 4000 tons sold some days since at \$56 at mill, but concessions would now be made to secure immediate orders. A few small lots also sold at about \$56, but it would be difficult to do business at that price to-day. Holders ask \$55, but there is no doubt that this quotation could be shaded for a good order. There are numerous inquiries, and there is a fair prospect that a considerable amount of business will be placed in course of the next 30 days. Buyers are cautious, however, and are very unwilling to make offers, unless for immediate delivery. The market may be considered feverish and unsettled at about \$53 @ \$55 at mill, for heavy sections. Light sections and streets sold at about \$57.

Old Rails.—The market at date of our last report closed weak at \$34. Since then a good many thousand tons have been sold at gradually declining prices. Last week sales were made at \$34, \$33 and \$32, this week at \$31, with offerings at a shade lower price to-day, but no buyers at over \$30. The market seems to be completely demoralized, and at the low prices named there is no disposition to buy in advance of requirements. Old Rails seem cheap in comparison with other articles, and if there is improvement anywhere, it may be looked for in this direction.

Scrap Iron.—The market is completely demoralized, and it is impossible to effect sales unless at a material reduction on recent quotations. Nominally, Wrought is worth about \$33; Cast, \$23, but we hear of no sales of large lots.

Nails.—The demand is about fair, and quotation \$5, same as last week.

PITTSBURGH.

(By Telegraph.)

Pittsburgh, Pa., April 28, 1880.

The Western Nail Manufacturers' Association held a meeting in this city to-day. The card rate was reduced to \$4 for rod. It was argued that the mills in the West should resume work, commencing on Monday next. The meeting adjourned until the regular session in May.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., April 27, 1880.

After a drought of two or three weeks, we are having copious rains, which were badly needed, as vegetation had commenced to lag for want of it, and navigation for the larger boats had become difficult. General business continues fairly active, although the dull in Iron circles still holds on with painful tenacity, the effect of which is visible in other departments of trade, and those who always look at the dark side of everything predict that there will be no improvement before July, if then. We are inclined to the belief that, as soon as values become more settled, and jobbers and consumers are satisfied that there will be no further shrinkage, business will at once revive, notwithstanding the wise predictions of the croakers.

Pig Iron.—The dullness and depression noted from week to week still continues. There is scarcely anything doing, and prices are weak, although nominally unchanged. The situation is very unsatisfactory to the producing interest, and, unless there is a very decided change, it is evident that many of the furnaces now in blast will blow out as soon as they have completed existing contracts. There will have to be an advance in the price of Pig or a material reduction in the cost of production, one or the other; otherwise furnacemen will be obliged to blow

Messrs. Bagnall quoted £10. 10/ for singles, £12 for doubles, and £13. 10/ for latens. Messrs. Millington and most other list houses asked £11 for singles. Messrs. Morewood, who have now eight Casse-Dormoy furnaces at work, equivalent to 24 ordinary furnaces, and who are erecting three others, quoted £12 for their Woodford brand, and best sheet iron of the Baldwin Wilden brand is £14 for singles, £15. 10/ for doubles, and £17 for trebles. Angle and rivet iron realized about £9; nail rods and hoops, £9. 5/; boiler plates, £11; and common ship plates, £10. Some specifications for annealed drawn fencing wire, 6 to 6, for Australia, were placed at a fraction over £12. Other figures were the same as at Wolverhampton the day previous. A few lots of sheets were sold on South American, Russian, and Australian account, and nail rods for China and India. Only a few parcels of galvanized iron of 100 tons each changed hands. There were a number of tin-plate manufacturers present, who had held a private caucus the preceding evening, at which they had arrived at the determination to fix I. C. rates at 25/ per box, delivered in Liverpool. They said that most of their business had quite two months' orders on their books, but as the price just named shows signs of weakness it is somewhat curious, and perhaps instructive, to compare the "prave" orders with the less valiant deeds. Probably the solution of the enigma is furnished by the circumstance that certain Birmingham and merchant houses had managed to get hold of lots at 23/ 6 to 24/ a few days prior to the meeting. It will be apparent, from the foregoing summary, that these important meetings have, on the whole, passed over very quietly and with indifferent business results.

THE QUARTERLY MEETINGS

CINCINNATI

LOUISVILLE.
Messrs. GEO. H HULL & Co., under
date of April 23, write us as follows: The
market is dull and depressed. We have not

Coke.—The demand has fallen off materially, as was to be expected in view of the depressed condition of the Pig Iron market, and prices are weak and drooping. The

Ore	30.00 @ 65.00
IRON ORE—NOMINAL.	
Ore for fix.	12.00 @ 15.00
For furnace.	7.00 @ 7.50

Articles	Quantities		Value	
	1879.	1880.	1879.	1880.
Pharmas small, No.			\$20,420	\$24,350
Brass, m. of, not be- lieve ordinance, cwt.	5,513	5,566	23,076	23,771
Rolling carriages for passengers, No.	35	35	4,566	9,000
Rail, w. & cast-iron, wag- gon, &c., No.	315	104	15,514	4,707
Coal, &c., tons	1,233,455	1,402,079	58,845	675,881
Quarry, tons, cwt.	30,125	30,066	19,476	114,355
Copper, wrt. cwt.	28,634	27,515	110,674	112,252
Sheathing, cwt.	38,779	23,598	10,726	7,872
Cast-iron, factory			279,008	264,567
IRON AND STEEL				
Fig. tons.	103,439	180,736	267,572	328,530
Quarry, tons, cwt.	30,125	30,066	19,476	114,355
Railroad, tons	37,197	46,602	248,668	260,000
Wire (except telegr. iron), tons	3,573	4,803	45,021	70,542
Hops, stals, & boiler & armor pit, tons.	14,402	23,330	166,102	305,650
Tools, tons	14,402	23,330	166,102	305,650
Cast or wrt. tons.	27,740	26,584	335,358	330,772
Old or re-manufact.	4,336	4,616	10,269	20,000
Tools, tons	14,402	23,330	166,102	305,650
M. steel & iron, tons	74	1,043	12,530	60,000
Lead, tons	3,568	4,797	17,110	47,482
MILLS				
WORE				
Steam engines			161,561	235,419
Other engines			1,367	1,367
Plato and pltd. and oil wares			15,118	14,989
Tools, tons			15,118	14,989
Cast, therewith			35,800	47,584
Tin (unwrt.), cwt.	10,733	9,365	35,443	47,191

the quantities, &c., sent during the month are shown in the following table, which also affords a comparison with the same month of 1879, and with February of this year.

Article.	Month	Month	Month
	of Feb.	of Mar.	of Mar.
	1886.	1886.	1890.
Alkali, cwt.	8,757	32,364	262.66
Hardware and cutlery	134,801	43,170	30,035
Pipe—			
In tons	69,511	106,708	394
Bar, angle, rod, &c., tons	6,236	10,488	574
Railroad, all, tons	19,498	15,108	172
Hoops, sheets, plates, &c.			
In tons	4,957	4,401	146
Tin plates, tons	10,957	14,801	14,801
Cast or wrought, tons	716	428	1,045
Old, tons	20,232	44,861	834
Sheet, unwrought, tons	2,918	5,695	657
Lead, unwrought, tons	10	113	49
Steam engines	2,670	3	165
Other machinery, &c.	29,850	38,551	18,603
Tin, unwrought, &c.	2,327	446	4,765
SPECIAL RECEIPTS			
Iron rails, tons	6,168	10,518	—
Steel rails, tons	6,162	4,019	375

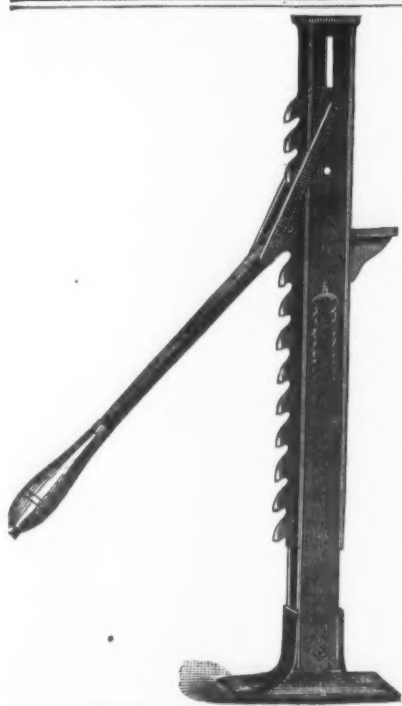
HARDWARE AND CUTLERY
to all the enumerated countries went in this

	1879.	March 1880.
Tu	1,879.	1,880.
Russia	2,4039	24,425
Germany	1,849	15,877
Holland	6,447	8,204
France	20,641	23,187
Spain and Canaries	7,770	6,608
United States	1,849	43,187
Spanish W. India Islands	5,583	3,401
Brazil	16,045	10,093
Argentina	6,680	5,199
British North America	1,849	10,093
British Possessions in S. Africa	11,094	12,132
British India	23,760	90,381
.....	49,101	33,746
Other countries	75,575	58,795

On the imports side the statistics also show a considerable increase.

HEMATITE PRICES
have run off somewhat of late, as will be seen from the appended leading rates of the West Coast (Cumberland, Furness) district :

	No. 1.	No. 2.	No. 3.
Cleator.....	121/	120/	119/
Lonsdale.....	100/	99/	98/
Workington.....	99/	98/	97/
West Cumberland.....			98/
Lowther.....	99/	98/	97/
Moss Bay.....	99/	98/	97/




Wrought and Malleable Iron.
We recommend this Wagon Jack as occupying less room, and being the most convenient and quick working Jack in market.

MILLERS FALLS CO.,
74 CHAMBERS ST., NEW YORK.

HEATON & DENCKLA,
Hardware Commission Merchants,
507 Commerce Street, Philadelphia.

E. & G. BROOKE'S "Anchor Brand" Nails, Brads, Spikes, &c.
MALLORY, WHEELER & CO.'S Door and Pad Locks.
UNION MANUFACTURING CO.'S Butts.
AMERICAN SCREW CO.'S Screws.
D. R. BARTON TOOL CO.'S Edge Tools, &c.
FRANCE'S Shutter Holders.
Anti-Window Rattlers, Brass and Nickel-Plated.
WESTERN FILE CO.'S Cast-Steel Files.
AMERICAN SHEAR CO.'S Shears and Scissors.
H. M. MYERS & CO.'S Shovels, Spades and Scoops.

BROWN & BRO.'S Brass and Copper Wire, Rivets, Spoons, &c.
GAYLORD MANUFACTURING CO.'S Tilt, Chest and Cupboard Locks.
AMES' Genuine  Chester Emery.
COLWELL & COLLINS, NORWAY BOLT CO., Norway Carriage and Tire Bolts.
PLYMOUTH MILL CO.'S Black and Tinned Iron Rivets.
AMERICAN MACHINE CO.'S Fluters, &c.
STUART, PETERSON & CO.'S Tinned and Enamelled Ware, &c.
HUSSEY, HOWE & CO.'S Bar & Sheet Cast Steel.

Also a large line of Heavy and Shelf Hardware.

F. HABERMAN,
MANUFACTURER OF
Stamped, Japanned and Plain
TINWARE,
AND THE CHEAPEST AND BEST
OIL AND GAS STOVES
IN THE MARKET.

NOTE.—These Stoves are made under license from the Kerosene Lamp Heater Co., the royalties are paid by me, and the Stoves have license tags attached, so that dealers may purchase and sell them with perfect safety.

SEND FOR CIRCULARS.

294 PEARL STREET, NEW YORK.

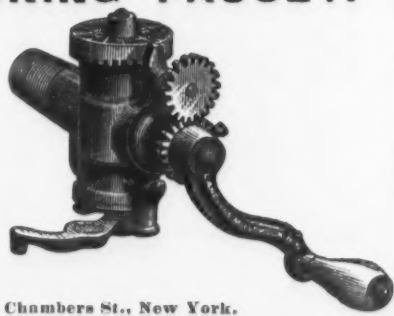
LANE'S MEASURING FAUCET.
Price, \$3.00.

For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw files. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY
LANE BROS., Millbrook, N. Y.

General Agency, GRAHAM & HAINES, 113 Chambers St., New York.



Bemis & Call Hardware & Tool Co.
PATENT COMBINATION WRENCH.
These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

Philadelphia "STAR" Bolt Works.
NORWAY IRON  FANCY HEAD BOLTS,
Carriage & Tire Bolts. **Star Axle Clips, &c**
TOWNSEND, WILSON & HUBBARD, 2301 Cherry St. Philadelphia, Pa.

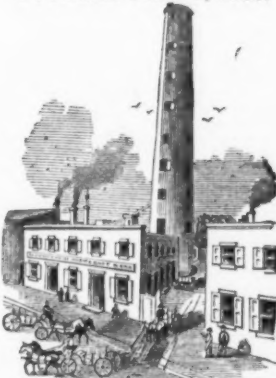
NATIONAL Horse Nail Co.
MANUFACTURERS OF
FINISHED
[BRIGHT OR BLUED]



These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.
DURRIE & McCARTY, Agents,
No. 97 Chambers St., New York

The Oldest Shot Tower in America.
FOUNDED JULY 4, 1808.



THOMAS W. SPARKS,
Manufacturer of
"SPARKS"
American Chilled Shot,
Rivalling the English and all Others.
STANDARD DROP & BUCK SHOT
AND BAR LEAD.
131 Walnut Street, Philadelphia.

St. Louis Malleable Iron Company,
2116 MARKET STREET,
ST. LOUIS, MO.
HENRY M. FILLEY, President. JOHN D. FILLEY, Secretary.
MANUFACTURERS OF
Malleable and Gray Iron Castings,
GENERAL HARDWARE, &c.

W. G. FOSSICK,
Engineer and Iron Agent,
86 Cannon St., London, England.
Iron and Steel Rails,
Bars, Angles, Plates,
Pig Iron & Puddled Bars.

Old Rails, Scrap Iron, Steel Rail Ends
c. f. l. American, or f. o. b. European ports.
Contracts negotiated on the most favorable terms.
Bankers: Barnetts, Hoares & Co., London.

RIEHLÉ BROS.
STANDARD
SCALES
AND
TESTING MACHINES

Patent "Self-Adjusting" Railroad Track Scales, pronounced "the most accurate and durable" over all competitors at World's Fair, 1876. In use by Pennsylvania, Lehigh Valley, Baltimore and Ohio, and other Railroads. Patent Coal and Hay Scales. Warehouse and Platform Scales and Scales for all purposes. Machines for testing materials, all sizes.
Works, 9th st., at Master's Store, 32 S. 4th st., Philadelphia. New York Office 91 Liberty Street.

"DRAW CUT" BUTCHERS' MACHINES.
Choppers, Hand and Power Stuffers.
Lard Presses.
Warranted thoroughly made and the Best in Use.
MURRAY IRON WORKS, Burlington, Iowa.

R. C. PURVIS,
Manufacturer of
Octagon Tea Pots.
Rear of 407 Cherry St., Philadelphia, Pa.
Send for Price List.

Established in 1839.

Formerly L. & A. G. Coes.

L. COES & CO.
Manufacturers of L. Coes'

GENUINE IMPROVED AND MECHANICS
Wide Bar Full Length.  Wide Bar Full Length.

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

NOVEMBER 10, 1863,
FEBRUARY 23, 1864,
REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Hand's
None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St. & 81 Reade St., N. Y.
DURRIE & McCARTY, Sole Agents.

The 1880 Pennsylvania Lawn Mower

OUTSTRIPS ALL COMPETITORS.
LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.



Points Claimed as being Meritorious:
Lightness combined with Strength in construction
It runs more easily.
It will cut longer grass.
It is more durable.
It requires less repairs.
It cuts the grass more smoothly.
The attractive appearance of the machine.
It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with any other machine in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style of Driving Wheels.	Power required.	Weight.	Price.
10 inch.	8 inch.	A Child.	30 1/2 lbs.	\$14.00
12 "	8 "	A Lad.	33 1/2 "	18.00
14 "	8 "	A Lady.	36 "	20.00
16 "	8 "	One Man Size.	38 "	22.00
18 "	8 "		41 "	24.00

NEW MACHINES.

For Cutting Long Grass

15 inch, 10 1/2 inch Driving Wheels, 6 1/2 inch Cylinder, Man Size, 48 lbs.	\$23.00
17 inch 10 1/2 inch Driving Wheels, 6 1/2 inch Cylinder, Man Size, 51 lbs.	25.00

For Sale By

LYOYD, SUPPLEE & WALTON, Philadelphia.
DURRIE & McCARTY, New York.
AMES PLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
SIMMONS HARDWARE CO., St. Louis, Mo.
HAMILTON & MATHEWS, Rochester, N. Y.
MARKLY, ALLING & CO., Chicago, Ill.

DUCHARME, FLETCHER & CO., Detroit, Mich.
LOCKWOOD, VANDORN & MILLER, Cleveland.
KRUSE & BAHLMAN, Cincinnati, O.
PRATT & CO., Elmira, N. Y.
LYOYD & CLARKE, La Crosse, Wis.
SMITH & SCHIBNER, Minneapolis, Minn.
HART & CO., Louisville, Ky.

THE NEW "CHARTER OAK" LAWN MOWER.

The most beautiful and perfect Lawn Mower in the world. It stands to-day at the head of the list of Lawn Mowers in the United States and Europe. It is mounted on two large driving wheels or pulleys, and instead of being on the outside of the frames, to run in the uncult grass, they are placed inside the frames, back of the cutting blades, running on a shaft, each independent of the other, allowing the machine to be turned either to the right or the left without injury to the sod, and to be turned around in a circle no greater than its own length, and cutting at the same time. Those desiring a perfect Lawn Mower will find the "CHARTER OAK" far superior to any other. It is more durable, easier to adjust, operate and keep in order, and the driving wheels being inside the frames, enables the operator to cut the grass clean around walks, drives, flower-beds, trees and shrubbery.
Manufactured in Five Sizes.
8-inch, 10-inch, 13-inch, 15-inch (standard) 18-inch.

H. S. MANNING & CO.,
Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished in U. S. Standard and Whitworth shape of threads.
111 Liberty Street, NEW YORK.

DAVID HYMES & Co.,
92 Church St., New York.
HEDGES HARDWARE CO.
HART & CO.
CLEMONS & CO.
KING & BLEIER.
PADLOCKS,
MONOGRAM, TERROR, ARGUS AND PINAFORE.
The Cheapest line of goods in the market.
Sample orders solicited.

NEW sizes Patent Malleable Iron Ollers, Nos. 2 and 3.
NEW pattern Heavy Screw Clamps; strongest in the market.
Send for Price List.
Malleable Iron Castings
Of superior quality, and Hardware Specialties in Malleable Iron made to order.
HAMMER & CO., Branford, Conn.

MICA
SUPERIOR QUALITY
North Carolina MICA.
 We are prepared to furnish
 Stove Manufacturers,
 Oil Stove Manufacturers,
 Jobbers and Retail Dealers,
 with
MICA
 of very best quality.
 Estimates furnished on application.
J. S. & M. PECKHAM,
 Utica, N. Y.,
 Miners and Wholesale Dealers in Mica.

Enterprise Mfg. Co.
 OF CINCINNATI.

Thos. C. White & Co.,
 Manufacturers of

BUILDERS' HARDWARE,

Locks, Latches, Hinges and
 Bronze and Brass Goods
 of all kinds.

JAIL LOCKS.

Liberal Discount to the Trade.
 Office & Factory, No. 50 Central Ave.,
 Cincinnati, Ohio.

PAT. "SCREW WINDOW BALANCES."

Retail Price, \$1 per window (four balances).

Liberal Discount to the Trade.
 Retain Medium and Light Window Sash at
 any point of opening, with large surplus hold-
 ing power in reserve, available if required
 by drawing the adjusting screws. An ac-
 quaintance with the genuine
 merits of these goods, and their
 simple requirements in use will
 insure to them the favor of the
 user and applier.

A Mechanism always wanted,
 and as easily applied to win-
 dows as the common sash
 pulley, rendering the use of
 boxed frames, cords, pulleys,
 and the perplexing task of
 hanging sash unnecessary.
 Sashes are locked with a meet-
 ing rail lock, as with weights.
 Sample set, 4 Balances, sent
 postage free upon receipt of \$1.
 For sale by the Hardware
 trade. Address

ROBT B. HUGUNIN,
 Manufacturer of Screw Balances,
 Post Office Box 593, Hartford, Conn.
 For sale by BUTLER & HUNTING,
 53 Day street, New York.

**"RIGHT SPEEDY"
 CORN SHELLER**

Is the best Hand Sheller
 made; does the best work
 and works the best; is war-
 ranted five years.

Agents Wanted in every County.
 Sample sent on receipt
 of \$5.00.

Specially adapted for export.
 Address Patentee and Sole
 Manufacturer.

CURTIS GODDARD
 Alliance, Ohio, U.S.A.

CLARK'S RUBBER WHEELS.

This wheel is the
 best now in the
 market, and is at-
 tracting the atten-
 tion of large manu-
 facturers on ac-
 count of the great
 saving of floors,
 which is ten times
 greater than the
 extra cost of this
 wheel.

Adapted to all purposes, viz., Warehouse trucks,
 platform trucks, scales, boxes, baskets and heavy
 caskets. For full particulars see the first issue of The
 Iron Age next month, or address

GEO. P. CLARK, Windsor Locks, Conn.

WILLIAM H. AINET,
 Chairman.

Mellert Foundry & Machine Co.,
 Limited.

(Works Established at Reading, Pa., in 1848.)
 Manufacturers of

CAST IRON WATER AND GAS PIPE,

With special Castings, Flange Pipe, Water Gates, Fire
 Hydrants, Lamp Posts, &c. The Improved Cana-
 dian Turbine Water Wheel, Machinery and
 Castings of every description for Furnaces, Rolling
 Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c.
 Columns, Brackets, Iron Railings, &c.

ARNOLD MELLERT, Supt., Reading, Pa.

**NATIONAL
 BOLT
 CUTTERS**
 GUARANTEED AHEAD OF ALL
 OTHERS FOR MANUFACTURERS &
 MACHINISTS
 SEND FOR CATALOGUE
 1825 SENECA ST. CLEVELAND, O.

Keystone Screw Co.

17th and Venango Streets,
 PHILADELPHIA.

J. BILLERBECK,

Manufacturer of

Iron Gimlet-Pointed Wood Screws

**PATENT
 CONCAVE OX SHOES.**

The only forged Ox Shoe
 made with concavity to fit
 hoof, and the best and cheap-
 est. Also, Flat Shoes with
 two calks at same price.

Greenfield Tool Co.,
 Greenfield, Mass.

NORRIS SASH PULLEY AND GAUGE.

Patented Feb. 18th, 1879.

HAND PULLEY GAUGE

NORRIS PULLEY

With one of our Gauges a carpenter can put in 20 Norris Pulleys in the time re-
 quired for one of the old style.

The Hand Gauge is retailed for \$1.00 each.

The Power Machines are used by all the principal Sash and Blind Factories in
 this country, as they cannot dispense with them and compete with those who use them.

Also,
"BOSS" MOLASSES GATES

with Ratchet Thumb Screw, so they can be made as tight as desired.

KIMBALL'S SOLID CAST STEEL SHOVELS AND SPADES

For Sale to the Trade and Exporters Only.

KIMBALL SHOVEL COM'Y,

SOLE MANUFACTURERS,

OFFICE, NO. 5 GERMAN STREET, BALTIMORE, MD.

A Sample Pulley, by Mail, costs 12 cents.

CLARK'S PATENT HORSE CLIPPERS.

Prize Medal Awarded, Paris, 1878.

No. 1

No. 2

No. 3

No. 4

No. 1.—This well-known instrument has now been before the public for many years, and has given uni-
 versal satisfaction, and is everywhere acknowledged to be by far the best, and therefore the cheapest in the
 market. Nos. 2 and 3 have also met with great success. No. 2.—ONE-HANDED CLIPPER, for heads, manes,
 quarters and difficult parts, leaving one hand at liberty to hold the horse, thus enabling the clipping to be
 performed by one man only. No. 3.—Same as No. 2, but with coarser teeth, for legs and bellies, and coarse
 hair, which would break the finer teeth. Avoiding the necessity of getting under the animal, and the con-
 sequent liability of accident to the man and also to the machine itself. No. 4.—A TWO-HANDED INSTRUMENT, with the patent grasshopper springs over the plates. This
 improvement renders the machine simply perfect, producing a softness and ease of motion not to be sur-
 passed, while by the peculiar and continuous self acting pressure of the spring the two plates are kept in
 cutting contact, and the machine requires no further adjustment whatever. These springs are also applied
 to Nos. 2 and 3. No. 4.—No stable should be without this set of incomparable instruments. See that all these
 Machines are fully stamped in strict accordance with the above illustrations—none others being genuine.
 To be obtained wholesale of Messrs. McKay & Co., 134 Duane St., and Messrs. Roseman Bros.,
 124 Chambers St., both of New York, and all merchants in the United States; and retail of all Saddlers,
 Ironmongers and Cutlers in the world, and of the Patentee, W. Clark, 232 Oxford St., London.

**"PINNACLE"
 SASH LOCK.**

BURGLAR PROOF.

In locking, the arm is brought forward, and the spring bolt
 engages with the post in the back plate. In unlocking,
 the knob is pulled out, and the arm throws back, where it is held.
 Only one spring is used in the lock.

**PAYSON
 MFG. CO.,**

CHICAGO.

ASBESTOS MATERIALS, FIBER, MILLBOARD, PACKING AND CEMENT.

The Patent "Air Space" Coverings for Steam Pipes, Hot-Blast Pipes, Boilers, &c.

Plastic or Hair Felt, with or without the Patent "Air Space" Improvement.

THE NATIONAL STEEL TUBE CLEANER.

Saves its cost every time it is used.

THE CHALMERS-SPENCE CO., foot 9th St., E. R., New York.

Delusion Rat and Mouse Trap,

Formerly manufactured by

CLAUDIUS JONES & CO.,

At Bridgeport, Conn.,

Have Removed to ERIE, PA.

This is the most successful Rat and Mouse
 Catcher on the market.

Send for Price Lists.

**TURNED
 MACHINE SCREWS,**

One-sixteenth to five-eighths diameter.

Heads and points to sample.

IRON, STEEL AND BRASS.

JOHN FELLOWS,

Successor to LYON & FELLOWS, Factory and Office, 14 Duxham Place, Williamsburgh, N. Y.

SPRING HINGES

WITH
 Patent Anti-Friction Springs,
 FOR
SCREEN DOORS.

PRICE LIST.—Per Dozen Pairs.

SINGLE JOINT HINGES.

(To Swing one Way.)

WITHOUT ACORN TIPS. WITH ACORN TIPS.

SIZE. BRASS. NICKEL PLATED. BRASS. NICKEL PLATED.

2 3/8 inch..... \$ 3 00 \$ 4 50 \$ 5 00 \$ 6 50

3 "..... 4 50 6 50 6 75 8 75

5 "..... 7 50 10 00 10 00 12 50

DOUBLE JOINT HINGES.

(To Swing both Ways.)

To be used on Door 1 inch thick, or less.

WITHOUT ACORN TIPS. WITH ACORN TIPS.

SIZE. BRASS. NICKEL PLATED. BRASS. NICKEL PLATED.

2 3/8 inch..... \$ 6 60 \$ 9 00 \$11 50 \$14 25

3 "..... 8 30 11 50 13 50 17 00

5 "..... 16 50 21 00 21 50 26 00

6 " Double for Office Doors..... 54 00

The large cut represents full size of our 5-inch
 Double Joint Acorn Tip Hinge for mortising.
 The small cut represents the plain Single Joint
 Hinges, but not full size.
 Sample pair will be sent by mail on receipt of
 price

Liberal Discount to the Trade.

SCOVILL MFG. CO., Nos. 419 & 421 Broome Street,
 NEW YORK.

**PATENT
 Elliptic Spring Whistles**

FOR
SPEAKING TUBES.

Patented April 24th, 1879.

We call the attention of the trade to the whistle for speaking tubes, represented in above cut,
 being superior, in a mechanical point of view, on account of the

PATENT ELLIPTIC SPRING,

which is much less liable to break and get out of order than the spiral spring usually used. These
 whistles being made entirely of metal, are very strong and durable. They are offered in a variety of
 styles at very reasonable prices. Send for illustrated circular and quotations.

We also invite an examination of our **PATENT REVERSIBLE DOOR LOCKS**, which
 by their peculiar construction, combine simplicity, strength and durability. In these Locks
 the combination of the Patent Lever and Spring renders the latch movement very easy and prompt in
 action.

Illustrated catalogues and price lists furnished on application.

TRENTON LOCK AND HARDWARE CO.,

Manufacturers of Superior Building Hardware.

Trenton, N. J.

AGENTS.

JAMES M. VANCE & Co., 211 Market St., Philadelphia, Pa.; JAMES MARSHALL, 48 Warren St., New York.

THE OHIO LAWN MOWER.

12-in. Cut...\$18.00. 14-in. Cut...\$20.00. 16-in. Cut...\$22.00.

For trade discounts, apply to

OHIO MFG. CO., Cleveland, Ohio.

**NORTH'S PATENT
 Universal Lathe Dog.**

It is very strong. Holds very strong. Will not
 deface finished work. Holds round square or ir-
 regular work. Always stands up square with the
 work and will not "skew." Is more evenly bal-
 anced than the common dog.

Send for circular.

SELDEN G. NORTH, No. 347 North Fourth Street, Philadelphia, Pa.

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Shelton & Co., Auburn, N. Y.	3
BABBIT METAL.	
Philadelphia Smelting Co., 12th and Noble, Phila.	31
BALE HOLDERS.	
Sterling, L. Jeff., Ashland, Ohio.	3
BARB WIRE.	
Scott H. B. & Co., Buffalo, N. Y.	11
BAR SCREWS.	
Shelton & Co., Birmingham, Ct.	3
BELLOWS.	
Scott Geo. H., Chicago, Ill.	3
BELLS (Sleigh).	
Bevin Bros. Mfg. Co., Easthampton, Conn.	3
BELT HOLES.	
Browning, Sium & Co., 8 Chambers st., N. Y.	32
BELTING, MAKERS OF.	
Alexander Bros., 122 N. 3d, Philadelphia.	33
Forepaugh Wm. F. Jr. & Bros., Philadelphia.	33
W. B. Belting and Packing Co., 37 Park Row, N. Y.	3
Peck & Bemis, Cleveland, O.	3
BICYCLES.	
Pope Mfg. Co., 65 Summer, Boston.	38
BIRD TAGS.	
Jewett John C., 435 Buffalo, N. Y.	34
Lindeman O. & Co., 24 Pearl, N. Y.	3
Maxheimer John, 27 and 29 Pearl, N. Y.	3
BOLT BRACES, MANUFACTURERS OF.	
Backus O. S., 122 Chambers st., N. Y.	16
Frederick & Co., 43 Chambers, N. Y.	3
Millers Falls Co., 74 Chambers, N. Y.	21
BLOCKS, TACKLE, MAKERS OF.	
McMillan Wm. B., 122 South, N. Y.	26
Penfield Block Works, Lockport, N. Y.	26
Providence Tool Co., Providence, R. I.	13
BLOWERS AND EXHAUST FANS.	
Sturtevant & Co., New York.	37
BOILER COVERINGS.	
The Chamberlain-Spence Co., foot 5th St., E. R., N. Y.	22
BOLT CUTTERS.	
National Bolt Cutters, 122 Seneca, Cleveland, O.	22
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y.	3
Wiley & Busell, Greenfield, Mass.	3
BOLT FORGING MACHINES.	
Forrestal S. C. & Co., Manchester, N. H.	34
BOLTS, SCREWS.	
American Bolt Co., Lowell, Mass.	9
Coleman Eagle Bolt Works, Philadelphia.	24
BRASS, MANUFACTURERS OF.	
Ansonia Brass and Copper Co., 19 Cliff, N. Y.	2
Bridgeport Brass Co., Bridgeport, Conn.	3
Brass Goods Mfg. Co., 43 Chambers, N. Y.	3
Brown & Bros., 8 Chambers, N. Y.	3
David John & Sons, 100 John, N. Y.	26
Holmes, Booth & Hayden, 40 Chambers, N. Y.	26
Manhattan Brass Co., 1st ave. & 27th st., N. Y.	2
Merchant & Co., 67 Market st., N. Y.	27
Plume & Atwood Mfg. Co., Chambers, N. Y.	27
Rome Iron Works, Rome, N. Y.	28
Sevill Mfg. Co., 41 Broome, N. Y.	28
Waterbury Brass Co., 26 Broadway, N. Y.	2
BRASS FOUNDRIES.	
Reeves Paul S., Philadelphia.	38
BRICK MACHINES.	
Miller S. P. & Son, 305 5th, Phila.	32
BRIDGE BUILDERS.	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	4
BROKER FRIGHT.	
Payne S. H., 25 Peck Slip, N. Y.	3
BUCKETS, CHAIN PUMPS.	
Crosby & D. & Co., New York.	3
BUTCHER AND SHOE KNIVES, MANUFACTURERS OF.	
Wilson John, Sheffield, England.	10
BUTTS AND IRON.	
American Spiral Spring Butt Co., 30 Beckman, N. Y.	38
New England Butt Co., 10 Platt, N. Y.	27
Sabin Mfg. Co., 43 Chambers, N. Y.	3
Stanley Works, New Britain, Conn.	8
Union Mfg. Co., 48 Chambers, N. Y.	7
CARRIAGE BUILDERS.	
Shelton & Co., Birmingham, Ct.	3
Townsend, Wilson & Hubbard, Philadelphia.	21
CARRIAGE HOISTS, ETC., MAKERS OF.	
Covert E. C., Farmer Village, N. Y.	3
Ives, Woodruff & Co., Mount Carmel, Conn.	10
Kimball & Co., 100 Chambers, N. Y.	3
Smith H. D. & Co., Plantville, Conn.	12
The E. D. Clapp Mfg. Co., Auburn, N. Y.	8
CARRIAGE SPRINGS.	
Dexter Spring Co., Hulton, Pa.	3
CAR AXLES.	
Robert A. & P. Co., 245 S. 4th, Philadelphia.	4
CANNERS.	
Clark Geo. P., Windsor Locks, Conn.	23
Phonix Caster Co., Indianapolis, Ind.	10
CASTINGS, IRON.	
Elwell Hardware Co., Bridgeport, Conn.	38
St. Louis Malleable Iron Co., St. Louis, Mo.	3
CAULKING IRONS.	
Carver John, 41 North 3d St., Brooklyn, E. D., N. Y.	6
CHAINS.	
Horton Thomas, 65 Elizabeth, N. Y.	3
CHISELS, MANUFACTURERS OF.	
Buck Bros., Milbury, Mass.	10
CHUCKS.	
Cushman, A. F., Hartford, Conn.	37
The E. Horton & Son Co., Windsor Locks, Conn.	3
CLACK SPRINGS, ETC.	
Carr & Moon, 24 W. 25th, N. Y.	3
CORRUGATED IRON.	
Mosley Iron Bridge and Roof Co., 5 Day, N. Y.	4
COTTERS AND COILS.	
Browning, Sium & Co., 8 Chambers st., N. Y.	32
COUNTERSINKS.	
Barber D. F., 121 Washington, Boston.	25
CRACKLES, MANUFACTURERS OF.	
Wile, Siedel & Co., 709 Market, Phila.	3
CUPOLA.	
Smith & Sayre Mfg. Co., 21 Cortlandt, N. Y.	36
CUTLERY, IMPORTERS OF.	
Baker Hermann & Co., 101 Duane, N. Y.	28
Catworthy P. & W., 82 Chambers, N. Y.	10
Friedmann & Lauterjung, 41 Chambers, N. Y.	10
CUTLERY, MANUFACTURERS OF.	
Burkman Aaron, Peppert, Mass.	10
Henry Seymour Cutlery Co., 84 Chambers, N. Y.	10
John Russell Cutlery Co., 40 Chambers, N. Y.	10
Meriden Cutlery Co., 40 Chambers, N. Y.	10
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The Lamson & Goodnow Mfg. Co., 84 Chambers, N. Y.	11
Wallace Bros. Wallingford, Ct.	11
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American Steam Appliance Co., Boston, Mass.	15
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Imbauer E., 21 Broadway, N. Y.	3
DIFFERENTIAL CUTLERY BLOCKS.	
Yale Lock Mfg. Co., 43 Chambers, N. Y.	3
DINNER PAIL.	
Haight John, Manchester, N. Y.	38
DISCOUNT TABLES.	
Jennings S. H., Deep River, Conn.	16
Lough Edward B., St. Louis Elevator, St. Louis, Mo.	16
DOOR AND GATE SPRINGS.	
Dunne P. R., 18 Fulton, N. Y.	34
Van Wagoner & Williams, 83 Beckman, N. Y.	34
DOOR BOLTS.	
Ives Hobart B., New Haven, Conn.	23
DRILLING MACHINES.	
Bornton & Plummer, Worcester, Mass.	37
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y.	3
Thorne, De Haven & Co., Philadelphia.	3
Wiley & Russell Mfg. Co., Greenfield, Mass.	3
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ELECTRIC MACHINES.	
Weston Dynamo-Electric Machine Co., Newark, N. J.	34
Braunsdorf & Co., 24 Pearl, N. Y.	3
ELEVATORS, MAKERS OF.	
Crane Bros. Mfg. Co., Chicago, Ill.	98
Stokes & Parrish, Philadelphia.	36
ELEVATOR BUCKETS.	
Rowland T. E., Brooklyn, N. Y.	3

EMERY AND EMERY WHEELS.	
Amherst Emery Co., Perth Amboy, N. J.	30
Irvin A. & Co., 14 Murray, N. Y.	30
High Valley Emery Wheel Co., Weissport, Pa.	38
ENGINEERS.	
Welmer F. L., Lebanon, N. Y.	3
ENGINEERS, AIR.	
Sherill Super Air Engine Co., 91 Washington, N. Y.	36
ENGINEERS, GAS.	
Schellum & Co., Philadelphia.	36
ENGINEERS, LOCOMOTIVE.	
Baldwin Locomotive Works, Philadelphia, Pa.	6
ENGINEERS, STEAM, MAKERS OF.	
Davis A. & Co., N. J.	24
Lovegrove & Co., Philadelphia.	27
ENGINEERS, WATER.	
The Norwalk Iron Works Co., S. Norwalk, Conn.	35
Vetherill Robt. & Co., Chester, Pa.	37
EQUALIZER.	
Bunger M. E. & Co., Indianapolis, Ind.	10
FAUCETS, BRASS, MAKERS OF.	
McNair & Harlin Mfg. Co., 29 Gold, N. Y.	35
FAUCETS, SELF-MEASURING, MAKERS OF.	
Enterprise Mfg. Co., of Pa., Phila. and N. Y.	27
Lane Bros. Millbrook, N. Y.	35
FENCING, ETC.	
Wrought Iron Fence Wks., Cleveland, O.	3
FILES, IMPORTERS OF.	
Carr J. & Riley, 30 Gold, N. Y.	30
FILES, MANUFACTURERS OF.	
Autumn File Works, Chambers, N. Y.	30
Barnett G. & H., 41 and 43 Richmond, Phila.	8
Clayton & Co., 100 Chambers, N. Y.	3
Dixon & Co., 100 Chambers, N. Y.	3
Everhart James M., Scranton, Pa.	38
Hiscox File Mfg. Co., West Chester, N. J.	38
Johnson & Bro., Commercial Newark, N. J.	38
McCaffrey & Bro., 172 and 174 N. 4th, Phila.	8
McNair & Harlin Mfg. Co., 29 Gold, N. Y.	35
Spencer J. R. & Son, Sheffield, England.	10
FIRE ARMS.	
Conway T. G., 20 Chambers, N. Y.	12
Hartley & Graham, 17 Maiden Lane, N. Y.	12
FIRE BRICK, MAKERS OF.	
Brooklyne Brick Works, Philadelphia, Pa.	32
Brooklyn Clay Refractory and Fire Brick Works, Van Dyke St., Brooklyn, N. Y.	32
Frank Radoch, 225 Fulton, N. Y.	32
Gardner Brothers, Pittsburgh, Pa.	32
Hall & Sons, Buffalo, N. Y.	32
Justice Philip S., Buffalo, N. Y.	32
Kreischer B. & Sons, 65 Goreck, N. Y.	32
Maurer Henry, 418 East 2d, N. Y.	32
McNair & Harlin Mfg. Co., 29 Gold, N. Y.	35
Perth Amboy Terra Cotta Co., Perth Amboy, N. J.	32
Valentine M. & Co., 200 Chambers, N. Y.	32
Watson John R., Perth Amboy, N. J.	32
FLINT AND EMERY PAPER AND CLOTH.	
Reeder, Adamson & Co., 730 Market, Phila.	37
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Shepard Hardware Co., Buffalo, N. Y.	27
FLY CRUTCHES.	
Bromwell Mfg. Co., Cincinnati, O.	3
FORGES, PORTABLE, ETC.	
Seaville John, 150 East 4th, N. Y.	26
Buffalo Forge Co., Buffalo, N. Y.	26
Cook William & Co., Chambers, N. Y.	26
Empire Portable Forge Co., Cohoes, N. Y.	26
Holt's Cleveland Forge Co., Cleveland, O.	26
Leavitt & Co., 218 Carter, Phila.	26
FOUNDRY FACINGS.	
Obermayer S. & Co., Cincinnati, O.	33
Reynolds & Co., 100 Chambers, N. Y.	33
Whitehead Bros., 417 W. 15th, N. Y.	3
FREY PANS.	
Y. Stamping Co., 111 Avenue A, N. Y.	27
FURNACES, MAKERS OF.	
Richmond & Fotts, 110 S. 4th, Phila.	5
FURNACE HOISTS.	
Stokes & Parrish, Phila.	3
FURNITURE SPRINGS.	
Carr & Moon, 24 W. 25th, N. Y.	3
GALVANIZED IRON.	
Hoopes & Merry, 417 W. 15th, N. Y.	26
Lefferts Marshall, 20 Beckman, N. Y.	3
GARDEN TOOLS.	
Dunlap C. W. & Co., 43 Chambers, N. Y.	4
GEARINGS.	
Comly J., Lincoln Park, N. Y.	34
GOVERNORS.	
Judson Junius & Son, Rochester, N. Y.	3
Smyle M. C., Philadelphia.	37
GRINDING LATHES.	
Lyons & Co., 33 West, N. Y.	30
Wood Walter R., 23 and 25 Front, N. Y.	30
Worthington & Sons, North Amherst, Ohio.	30
GRINDING MACHINES.	
Kneeland F. L. (DuPont) 70 Wall, N. Y.	28
Ladiz & Hall, 100 Chambers, N. Y.	28
HANDLES, MAKERS OF.	
Hartigan Wm. R., Burlington, Conn.	20
Kuselman Samuel, 80 N. Quakerstown, Pa.	20
HANGERS, HORN DOOR.	
Kidder Slide Door Hanger Co., Romeo, Mich.	27
HARDWARE COMMISSION MERCHANTS.	
Fernald & Sise, 100 Chambers, N. Y.	28
Heaton & Denckla, 30 Commerce, Phila.	28
Hynes David & Co., 94 Church, N. Y.	21
W. W. H. & Co., London and Paris.	21
HARDWARE DEALERS.	
Lloyd, Supply & Walton, 65 Market, Phila.	21
Shepard Hardware Co., Buffalo, N. Y.	27
HARDWARE IMPORTERS.	
Baker Hermann & Co., 101 Duane, N. Y.	28
McCormick & Co., 100 Chambers, N. Y.	28
HARDWARE MANUFACTURERS.	
Comly Jas., 430 Paul st., Philadelphia.	10
Coulter, Frazier & Co., 100 Chambers, N. Y.	10
Cowles Hardware Co., Unionville, Conn.	10
Enterprise Mfg. Co., Phila.	27
Greene Mfg. Co., 100 Chambers, N. Y.	27
Henderson Tool Co., Greenfield, Mass.	27
Jennings C. E. & Co., 48 Chambers, N. Y.	27
Leavitt & Co., 218 Carter, Phila.	26
Miller's Falls Co., 74 Chambers, N. Y.	21
Payson Mfg. Co., 110 W. Jackson, Chicago.	22
Shepard Hardware Co., Buffalo, N. Y.	27
The Clark Mfg. Co., Buffalo, N. Y.	27
Tiebout W. & J., 31 Chambers, N. Y.	27
Union Mfg. Co., 48 Chambers, N. Y.	27
Wagoner & Williams, 83 Beckman, N. Y.	27
HARDWARE SPECIALTIES.	
Boston Hardware Co., Boston, Mass.	27
Cleveland Wrought Iron Fence Works, Cleveland, O.	3
Kimball Shovel Co., Baltimore, Md.	23
Leavitt & Co., 218 Carter, Phila.	26
Seaville John, 150 East 4th, N. Y.	26
Sprague Novelty Works, Rochester, N. Y.	24
HARNESS SNAPS.	
Covert Mfg. Co., West Troy, N. Y.	3
HARROWS.	
Bunger M. E. & Co., Indianapolis, Ind.	10
HAY KNIVES.	
Holmes & Co., East Wilton, Me.	10
HINGES.	
Seaville John, 150 East 4th, N. Y.	26
Stokes & Parrish, Phila.	3
HOG RINGERS.	
Chambers, Bering & Quinlan, Decatur, Ill.	27
HOLDING ENGINES, MAKERS OF.	
McNair & Harlin Mfg. Co., 29 Gold, N. Y.	35
The Norwalk Iron Works Co., S. Norwalk, Conn.	35
HOLDING MACHINES.	
McNair & Harlin Mfg. Co., 29 Gold, N. Y.	35
Clem & Morse, 413 Cherry, Philadelphia.	37
Harrington Edwin & Son, Philadelphia, Pa.	37
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y.	3
Stokes & Parrish, Phila.	3
HOLLOW WARE.	
Wells W. T., 75 Beckman, N. Y.	30
HOOKE (Cotton & Hair).	
New York Handle & Mallet Works, 45 E. Houston, N. Y.	13
HORSE CLIPPERS.	
Baker Hermann & Co., 101 Duane, N. Y.	28
Clark W., London, England.	28
HORSE FORKS.	
Waldron J., Muncy, Pa.	30
HORSE NAILS, MAKERS OF.	
Ausable Horse Nail Co., 4 Warren, N. Y.	25
Bridgeport Iron Co., Bridgeport, Mass.	25
W. P. Nail Co., Cleveland, O.	25
National Horse Nail Co., Vergennes, Vt.	21
Putnam Nail Co., Boston.	9
Saranac Horse Nail Co., Plattsburg, N. Y.	12
HORSE SHOES, MAKERS OF.	
Bradley & Co., Philadelphia, Pa.	31
Burton Iron Works, Troy, N. Y.	31
Rhode Island Horse Shoe Co., Providence, R. I.	31
Schoenberger & Co., Pittsburgh, Pa.	31
HOSE CARTS AND REELS.	
Castle Hose Reel Co., Cleveland, O.	4
HOSE CUTTERS.	
Manard & Bro., Rockford, Ill.	33
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Pierce Geo. N., Buffalo, N. Y.	3
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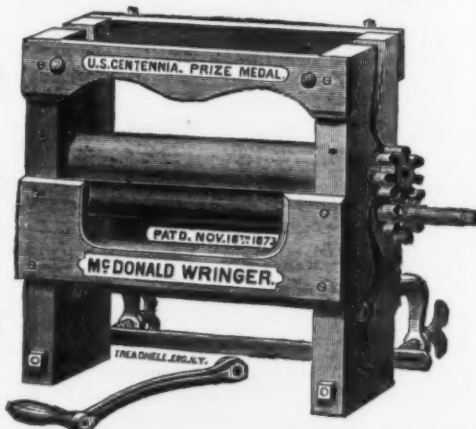
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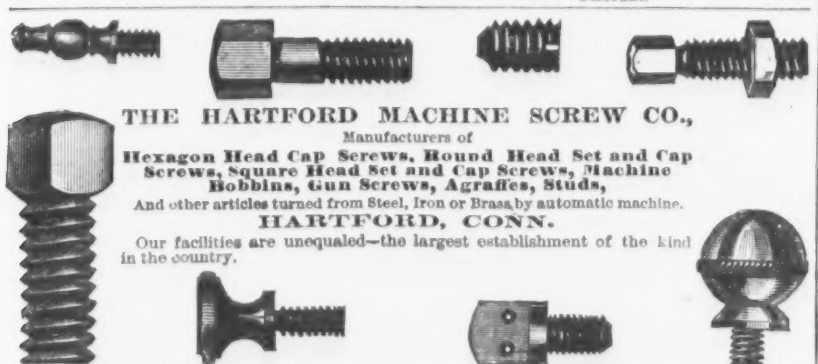
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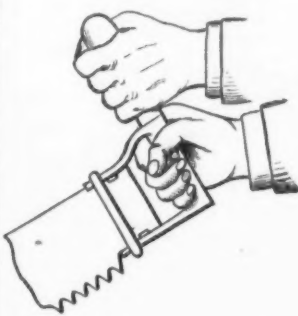
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Every Cross-Cut Saw having a handle, part of which, adapted to one hand, is above the blade, and part, adapted to the other hand, opposite the end of the blade, is an infringement of the said patent, and prompt legal proceedings will be taken against manufacturers of and dealers in saws provided with such handles.



The following is the claim on which we rely:
"In a cross cut saw, the combination of the saw-blade with a handle, part of which, adapted to one hand, is above the said blade, and part, adapted to the other hand, directly opposite the end of the said blade, all substantially as set forth."

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HOWSON & SON, Philadelphia and Washington, Attorneys for DISSTON & SONS.

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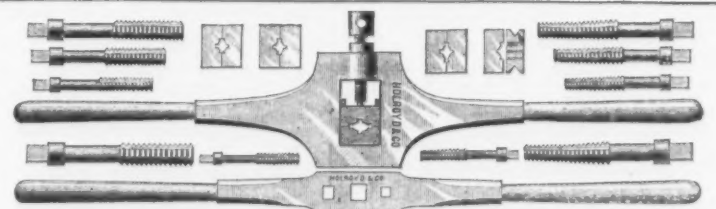
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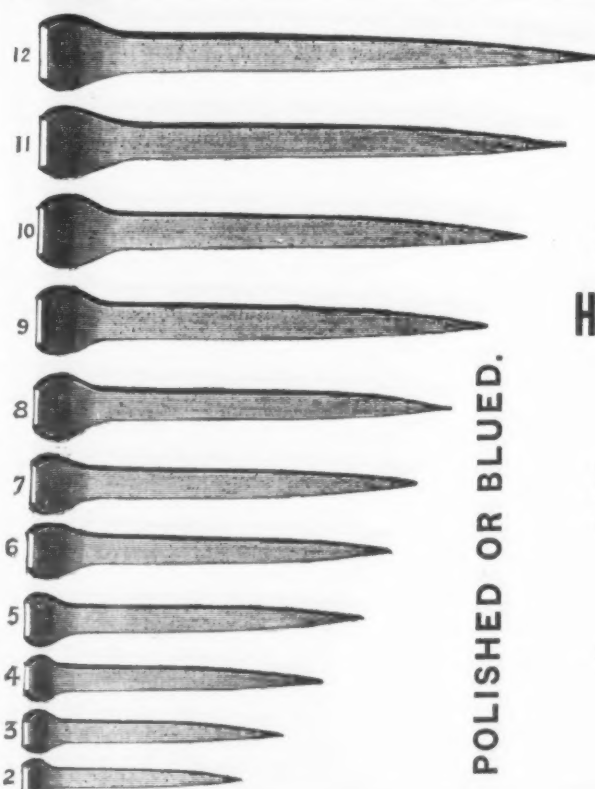
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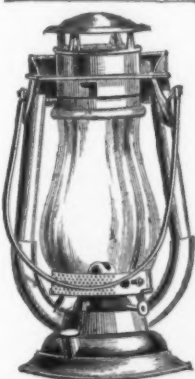
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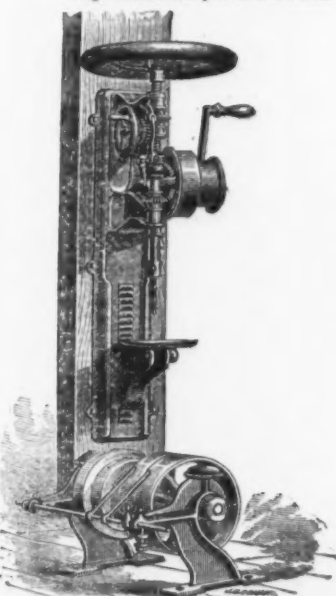
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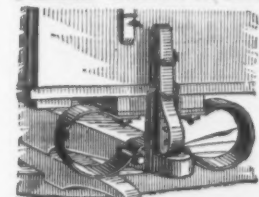
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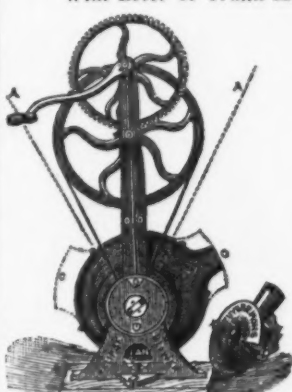
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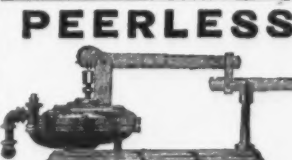
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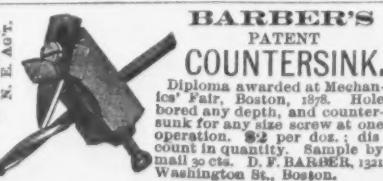
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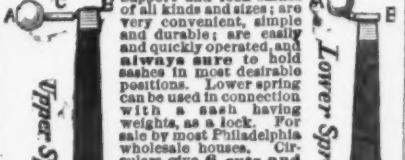
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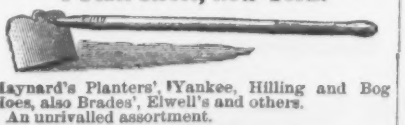
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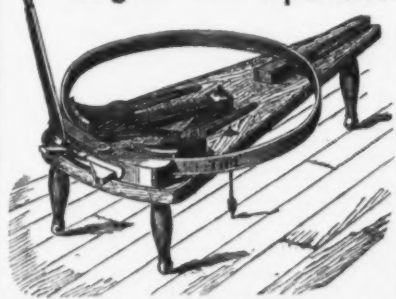
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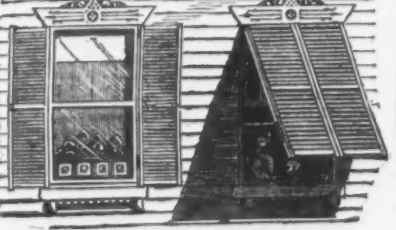


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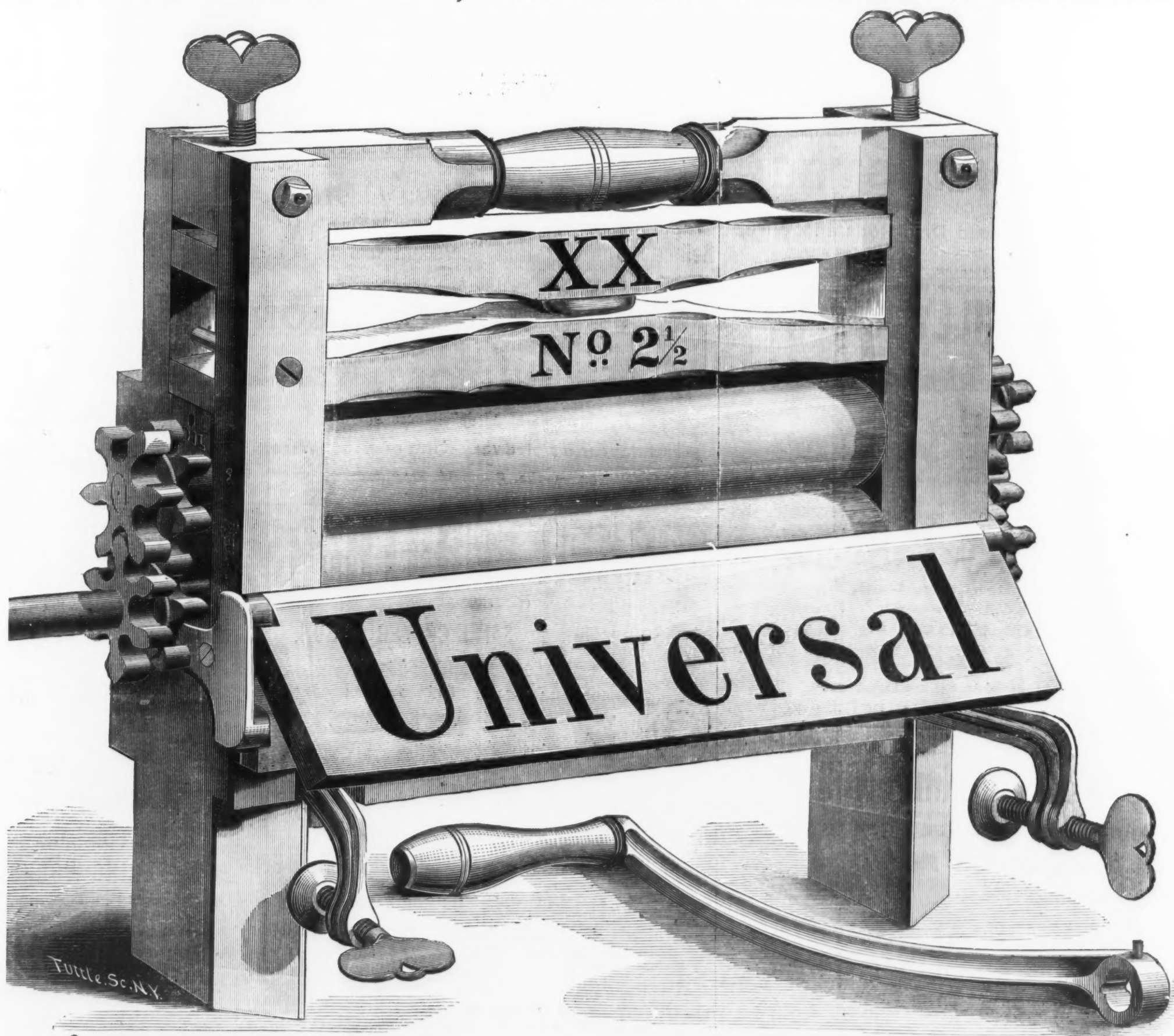
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of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only within reach of the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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THE WHOLE FOREIGN HARDWARE TRADE,

so far as the experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the Ironmonger and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

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FIRE BRICK.
BEST AND CHEAPEST.
Established 1845.
Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

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FIRE BRICK
Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK
And Furnace Blocks
DRAIN PIPE & LAND TILE.
Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,
Twenty-third Street,
Above Race, **PHILADELPHIA.**
Twenty years' practical Experience.

PERTH AMBOY TERRA COTTA CO.,

Successors to

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ARCHITECTURAL TERRA COTTA

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Brooklyn Clay Retort

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Manufacturers of Clay Retorts, Fire Brick, Gas
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Office: No. 86 Van Dyke St.

Watson Fire Brick Manufactory,
ESTABLISHED 1856.

JOHN B. WATSON, Perth Amboy, New Jersey.
Manufacturer of

FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
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Fire Clays, Fire Sand, and Kaolin for Sale.

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Manufacturer of FIRE BRICK, HOLLOW
BRICK AND CLAY RETORTS.
WORKS: PERTH AMBOY, NEW JERSEY.
Office & Depot, 418 to 422 East 23d St., N. Y.

TROY FIRE BRICK WORKS,

Troy, N. Y.,

JAMES OSTRANDER & SON,

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Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and
Dealers in Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.

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Manufacturers of

STANDARD SAVAGE FIRE BRICK,
TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and
Miners and Shippers of Fire Clay.
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WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

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And Brickmakers' Tools in General.
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309 South 5th St., Philadelphia.

RUDOLPH FRANK,
Office, 229 FULTON STREET,
NEW YORK.

ALUMINA and
SILICA

FIRE BRICKS

Works, BROOKLYN, on
the East River.

Through Cars, Canal Boats
and Vessels loaded direct from the
Works to all points.

PURE SILICA FIRE BRICK,
MADE BY THE
Landore Siemens Company,
Specially for OPEN-HEARTH FURNACES.

More "heats" obtained from them than from any other Bricks known.

Imported, to order only, by

PHILIP S. JUSTICE, Sole Agent in United States,
14 NORTH FIFTH STREET, PHILADELPHIA.

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A SEMI-WEEKLY JOURNAL

DEVOTED TO

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THIS JOURNAL covers a ground the extent of which is
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Twelve Dollars per year.

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SPECIALTIES:

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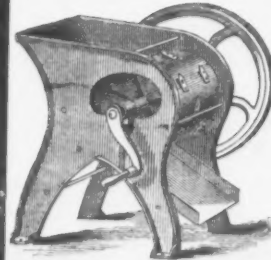
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FACTORY,

1031 North Main St.,

SAINT LOUIS, MO.



CREASEY'S ICE BREAKER.

Patented Oct. 29, 1878.

The Simplest, Cheapest and Best Ice Breaker
ever offered to the Public.

Manufactured and Sold By

JOSEPH S. LOVERING WHARTON,

Southeast Cor. 15th and Wood Sts.,

Send for circulars.

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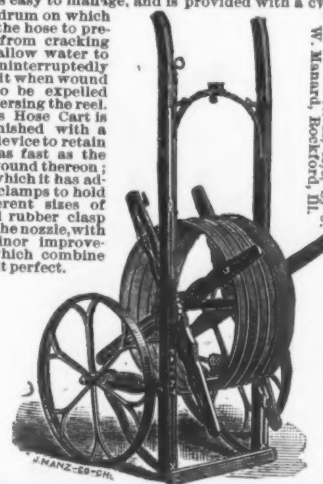
The Drum Hose Cart.

Designed for Handling Yard Hose in Con-
nection with Yard Hydrants.

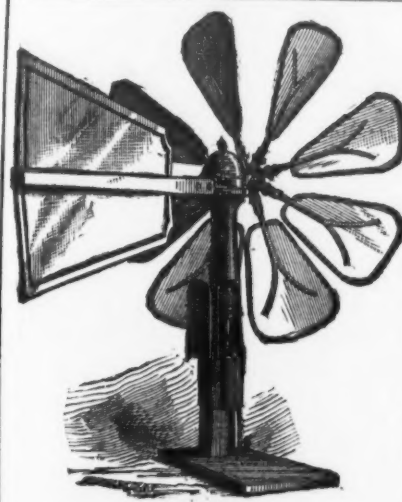
1st. This Hose Cart is practical in every way; sub-
stantially made, and gives the best satisfaction to
every person using it.

2d. It is easy to manage, and is provided with a cyl-
indrical drum on which to wind the hose to pre-
vent it from cracking and to allow water to
pass uninterruptedly through it when wound
up, or to be expelled upon reversing the reel.

3d. This Hose Cart is also furnished with a
ratchet device to retain the reel as fast as the
hose is wound thereon; besides which it has ad-
justable clamps to hold the different sizes of
hose, and rubber clasp to grasp the nozzle, with
other minor improvements, which combine
to make it perfect.



Reel C takes 50 ft. 1-in. or 75 ft. 3/4-in. Hose...\$20.00 each
Reel B takes 100 ft. 1-in. or 150 ft. 3/4-in. Hose... 6.00 each
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Write for discounts to the trade.
P. O. Box 2184. **MANARD & BRO.,** Rockford, Ill.



THE
HARTFORD COMPRESSED AIR PUMP
Water Driven to any Height and Distance
by Compressed Air.

Country Houses Supplied Cheaply and Certainly for
Bath Rooms, Water Closets, Hot and Cold Water
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Southwark Hardware Co.

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Manufacturers of

FOUR GRADES OF

COUNTER

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400 and 600 lb.

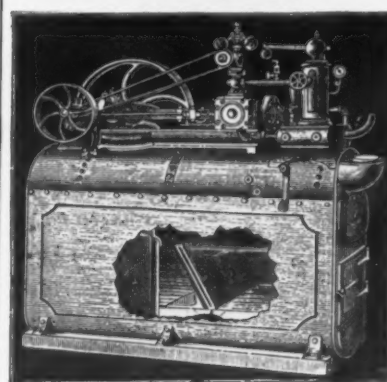
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EQUAL TO THE BEST AND LOWER
IN PRICE.

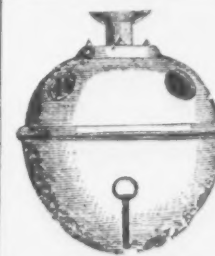
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Return Flue Boiler, large Fire Box, no sparks.
Do not fail to send for circular to

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Established 1838

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Manufacture
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Pure White Lead, Red Lead, Litharge,
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AND PAINTERS' COLORS.

Brooklyn White Lead Co.



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Manufacturers of the well-known brand of

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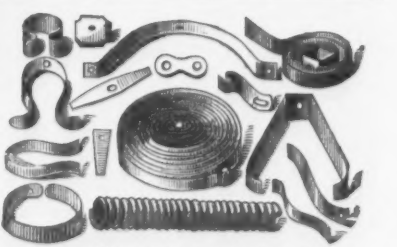


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MANUFACTURERS OF

White Lead (Atlantic), Red Lead,
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13 Stops, 3 set Reeds, Stool, Book,
only \$98. Pianos, Stool, Cover &
Book only \$143.75. Paper free.
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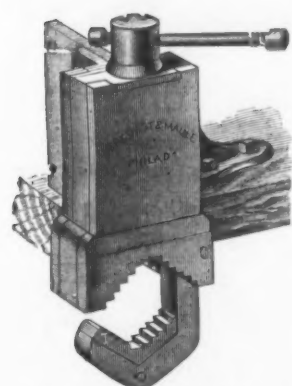
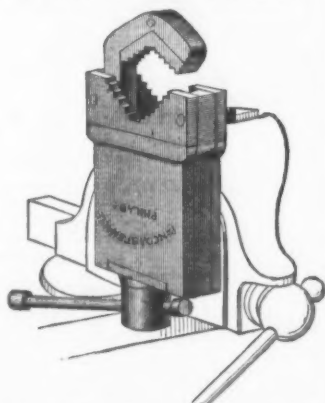
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Successors to Milo Peck, Manufacturers of

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WE HAVE A LARGE STOCK OF SPECIAL DROP PATTERNS.Special attention given to the making of all Drop Dies.
Special Machinery fitted up to order.

Send for Price List.

New Haven, Conn.

IMPROVED PIPE-FITTERS' VISE.STRONG,
LIGHT,
EFFICIENT,
CHEAP.

To meet the requirements of the large number of persons who have use for such an article, we invite attention to our Improved Pipe Vise. This Vise can be used either as a permanent fixture to work-bench, attached to angle plate or can (unlike others) be held between the jaws of any Machinist's or Blacksmith's Vise; the movable jaw being OPEN ON SIDE permits work to be gripped at any desired point without slipping it in from end, and allows of FITTINGS BEING HELD SECURELY; the Box is made of Malleable Iron, the Screw of Wrought Iron, and the remainder of Solid Steel throughout. The Steel Gripping Jaws can be duplicated and replaced at any time when worn out. It is a very convenient tool, well adapted to the wants of Plumbers, Pump Fitters, Well-Drivers, and all who have use for a tool that is strong, light, efficient and cheap, which can be readily carried about with kit of tools.

MANUFACTURED BY

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"BLAKE'S CHALLENGE" ROCK BREAKER.

Patented November 18, 1879.

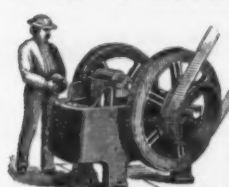
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Awarded First-Class Medal of Superiority by the American Institute, 1879.

Rapidly superseding all old styles of **Blake Crushers**, on account of its superior strength, efficiency and ease of adjustment. Adopted in preference by leading Mining and Railway companies, and many important cities and towns. Blake Crushers of our older style, containing patented improvements **exclusively our own**, for sale at low figures. The public is cautioned to beware of the representations of certain parties who have **imitated** our patterns of these, **copied our old cuts**, and are advertising "**Blake Crushers**" weighing 1300 pounds less than ours, at same price. For circulars relating to the new "**Blake's Challenge**," and all older styles of Blake Crushers, address

BLAKE CRUSHER CO., New Haven, Ct.,

Patentees and Original Manufacturers under patents of Eli W. Blake and Theo. A. Blake.

The Farrel Foundry and Machine Co.

View of Rock Breaker.

ANSONIA, CONN.,

Manufacture Improved

ROCK & ORE**BREAKERS,**

(THE "BLAKE" STYLE),

designed for breaking to small pieces and one-third dust all kinds of hard and brittle substances, such as Quartz, Emery, Gold and Silver Ores, Coal, Plaster, Iron, Copper and Lead Ores; also, Stone for making Concrete and Railroad Ballast.

Twenty years of practical test, at Home and Abroad, has proven this machine to be the best one ever invented for the purpose. Mr. S. L. MARSDEN, for the past fifteen years connected with the manufacture of these machines, has charge of this department, and will personally superintend their erection within a reasonable circuit. Chilled Rolls and Rolling Mill Machinery, Power Presses, single and double acting; also, Hammers, Drops and Lifters; Shafting, Pulleys and Hangers.

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Machinery, &c., &c.

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WARRANTED CAST STEEL**SAWS**

Of every description, including

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Manufacturers of

Movable Toothed Circular Saws,

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And SOLID SAWS of all kinds.

Trenton, N. J.



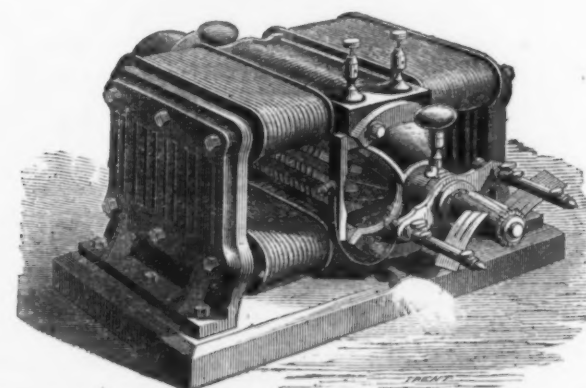
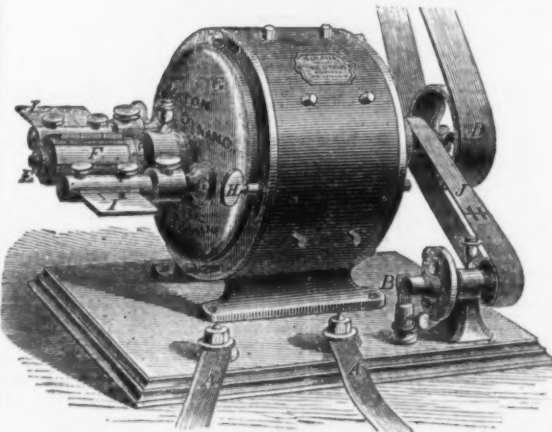
Manufacturers of GALVANIZED PUMP CHAIN FOR CHAIN PUMPS.

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MANUFACTURERS OF

Machines for Electric Light, Electrotyping and Electro-Plating.

ARE MAKING

THE MOST POWERFUL, SIMPLE AND COMPACT ELECTRIC LIGHT MACHINE IN THE WORLD.

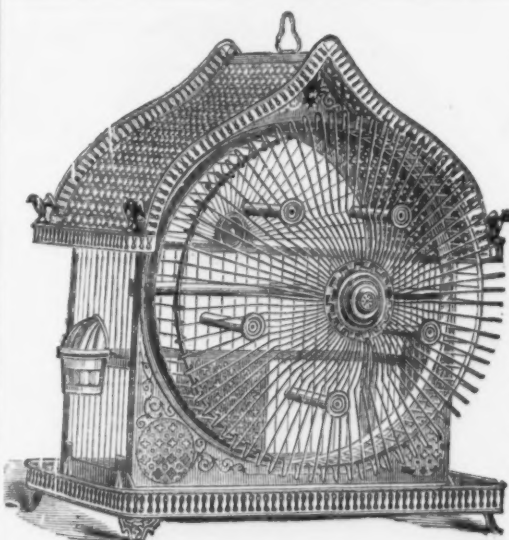
By actual tests this machine has been found to yield more than double the amount of light per horse-power obtained from the best machines built in this country.

Please send full particulars regarding buildings or localities to be lighted, available power, &c.

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PATENTED.



The Revolving Perch Cage must be seen in practical operation to be able to appreciate what a charming novelty it is; or the great advantage to the bird, in the way of exercise, which all canaries require to keep them healthy, and consequently in song.

Catalogue sent to dealers only on application.

Also Manufacturers of the hand-somest line of Bird Cages in the United States.

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This improved furnace burns coal oil (kerosene) of any grade without smoke or odor, heating coppers equal to, or better than, charcoal. The fire is lighted in less time, and is as easily controlled as a lamp. Those doing piece work find this greatly to their advantage. We have letters from manufacturers who have thoroughly tested it with coppers of all sizes, saving, "We get a saving of 25 per cent. over charcoal in its use." Any one ordering a furnace C. O. D. or with money inclosed, if not as represented, money, less freight, refunded. Send for circulars of stoves and torches. Address, **VAPOR OIL STOVE CO.,** Cleveland, Ohio.

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Manufacturers of

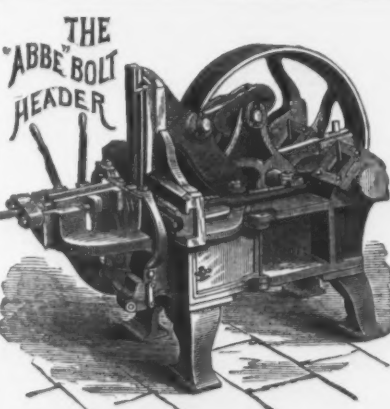
Grant's Grain, Coffee, Rice, Cochineal and Pimento Fans,



TURKEY WING GRAIN CRADLES, 4, 5 and 6 fingers.
GRAPE VINE GRAIN CRADLES, 4 fingers.
SOUTHERN PATTERNS GRAIN CRADLES, 4, 5 and 6 fingers.
All of a superior quality. None genuine unless marked Grant Fan Mill and Cradle Co. Send for illustrated catalogue and price list. P. O. Address, **MELROSE, Rensselaer Co. N. Y.**

PRESSED STEEL GEARING.

Most powerful, accurate, durable and cheapest. Any shaped teeth. **J. COMLY, Patentee,** LINCOLN PARK, N. J.

**THE "ABBE" BOLT FORGER****THE "ABBE" PATENT Bolt Forging Machine.**

Any Imaginable Shape of Head can be Produced.

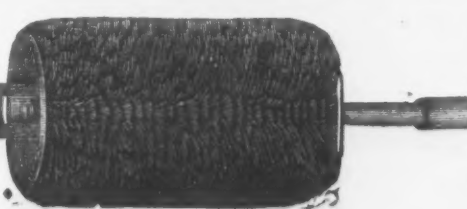
All its working surfaces above the Water and Cinders. There are neither Gears, Cams nor Springs—every motion being positive. For particulars address

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Manchester, N. H.

Also Manufacturers of

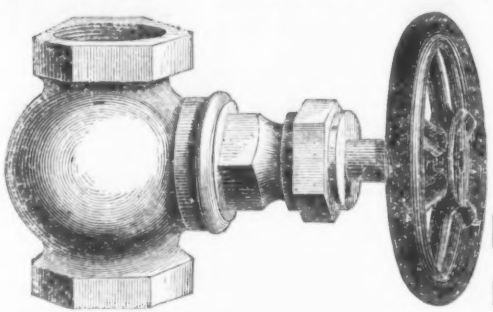
The "Pamer" Power Spring Hammer.

**PATENT STEEL TUBE AND FLUE BRUSH.**

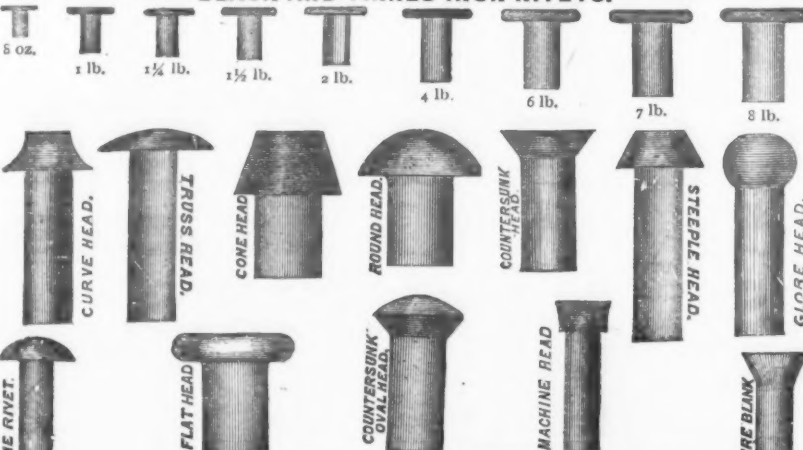
Manufactured and for sale in the **L. B. Flanders Machine Works,**

1025 Hamilton St., - - - PHILADELPHIA.
Descriptive circular on application.

McNab & Harlin Mfg. Co.,
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BRASS COCKS AND VALVES,
For STEAM, WATER and GAS.
WROUGHT IRON PIPE AND FITTINGS,
PLUMBERS' MATERIALS
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BLACK AND TINNED IRON RIVETS.
6 oz. 1 lb. 1 1/2 lb. 2 lb. 4 lb. 6 lb. 7 lb. 8 lb.
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Manufacturers of every description of First Quality
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ALL KINDS OF
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KEYSTONE BOILER RIVETS
PHILADELPHIA:
"THE BOSS" JACK-SCREW.
R. D. WYNN,
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Sole manufacturer of the above Screw. Indorsed by builders, railroad and mining men as the best screw jack in the market. Also manufactures Press Screws, Lard and Wine Presses, Tackle Blocks, &c. Circulars and prices, address as above. (Please say The Iron Age.)
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Manufacturers of
GRASS, GRAIN & BUSH SCYTHES,
Hay Knives & Corn Knives.
West Winsted, Conn.
See our advertisement in The Iron Age first issue of each month.



THE "OLD RELIABLE"
UNIVERSAL
Clothes Wringer.
Improved with Rowell's Double Cog-Wheels on both ends of each roll.
Over 500,000 sold!
And now in use, giving "Universal" satisfaction
EVERY WRINGER WARRANTED.
Be sure and inquire for the "Universal."
Sold by the Principal Jobbers in Hardware and House-Furnishing Goods everywhere.
Special rates given for export.
Metropolitan Washing Machine Co.
32 Cortlandt St., New York.



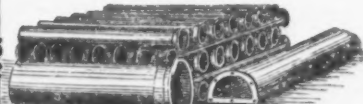
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STEAM ENGINES,
Air Compressors,
HOISTING ENGINES.
The Norwalk Iron Works Co.,
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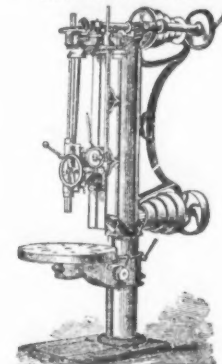
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SPRAGUE'S IMPROVED
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The rings are expanded without removing the cylinder head. Guaranteed to save ten per cent. over any now in use. Special attention given to repairing, improving, &c. Send for circular and price list.
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FOR WATER AND GAS.
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400 CHESTNUT STREET.
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CARR'S
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Water
Closets,
PUMPS, CABINET WOOD WORK, &c.
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Holt Portable Forge.
All Styles and Sizes.
Furnaces for Jewelers and Assayers
MANUFACTURED BY
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F. PORTER THAYER, Manager.



BOSTON.
Reported by Macomber, Bigelow & Douse, 155 to 164 Oliver St.
Anvils.—"Eagle American"..... \$ 45.00
Apple Papers.—Reading Turn Table..... \$ 40.00
Goodell Turn Table..... \$ 5.00
Improved Turn Table & Push-off..... \$ 7.50
Lighting..... \$ 6.00
Hudson's Turn Table and Push-off..... \$ 6.00
Alken's Tools..... \$ 40.00
Anvil & Vise..... \$ 25.00
No. 1, \$ 25.00; 2, \$ 45.00; 3, \$ 50.00 each.
Augers & Bits.—Snell's Auger..... \$ 15.00
L. Hammond's Ship Auger..... \$ 15.00
Jennings's Bits..... \$ 10.00
Cook's Bits..... \$ 10.00
Steam Hollow Augers..... \$ 2.00
Shepardson's Double-Cut Bits..... \$ 45.00
Stearns' Extension Hollow Auger..... \$ 25.00
Bonney's..... \$ 25.00
Pierce's Bits..... \$ 25.00
Griswold..... \$ 40.00
Axes.—Blue Jacks..... \$ 10.00
Red Cross..... \$ 10.00
Hoy's..... \$ 30.00
Dowse..... \$ 30.00
Ax Handles.—Oak Extra, 3 lb., No. A..... \$ 2.50
" 3 lb., No. A..... \$ 2.50
" 3 lb., No. B..... \$ 2.50
" 3 lb., No. C..... \$ 2.50
" 3 lb., No. D..... \$ 2.50
" 3 lb., No. E..... \$ 2.50
" 3 lb., No. F..... \$ 2.50
" 3 lb., No. G..... \$ 2.50
" 3 lb., No. H..... \$ 2.50
" 3 lb., No. I..... \$ 2.50
" 3 lb., No. J..... \$ 2.50
" 3 lb., No. K..... \$ 2.50
" 3 lb., No. L..... \$ 2.50
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" 3 lb., No. N..... \$ 2.50
" 3 lb., No. O..... \$ 2.50
" 3 lb., No. P..... \$ 2.50
" 3 lb., No. Q..... \$ 2.50
" 3 lb., No. R..... \$ 2.50
" 3 lb., No. S..... \$ 2.50
" 3 lb., No. T..... \$ 2.50
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" 3 lb., No. V..... \$ 2.50
" 3 lb., No. W..... \$ 2.50
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" 3 lb., No. Z..... \$ 2.50
" 3 lb., No. AA..... \$ 2.50
" 3 lb., No. AB..... \$ 2.50
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" 3 lb., No. AR..... \$ 2.50
" 3 lb., No. AS..... \$ 2.50
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" 3 lb., No. AU..... \$ 2.50
" 3 lb., No. AV..... \$ 2.50
" 3 lb., No. AW..... \$ 2.50
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" 3 lb., No. AY..... \$ 2.50
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" 3 lb., No. BD..... \$ 2.50
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" 3 lb., No. BW..... \$ 2.50
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" 3 lb., No. DF..... \$ 2.50
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" 3 lb., No. IY..... \$ 2.50
" 3 lb., No. IZ..... \$ 2.50
" 3 lb., No. JA..... \$ 2.50
" 3 lb., No. JB..... \$ 2.50
" 3 lb., No. JC..... \$ 2.50
" 3 lb., No. JD..... \$ 2.50
" 3 lb., No. JE..... \$ 2.50
" 3 lb., No. JF..... \$ 2.50
" 3 lb., No. JG..... \$ 2.50
" 3 lb., No. JH..... \$ 2.50
" 3 lb., No. JI..... \$ 2.50
" 3 lb., No. JJ..... \$ 2.50
" 3 lb., No. JK..... \$ 2.50
" 3 lb., No. JL..... \$ 2.50
" 3 lb., No. JM..... \$ 2.50
" 3 lb., No. JN..... \$ 2.50
" 3 lb., No. JO..... \$ 2.50
" 3 lb., No. JP..... \$ 2.50
" 3 lb., No. JQ..... \$ 2.50
" 3 lb., No. JR..... \$ 2.50
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" 3 lb., No. JT..... \$ 2.50
" 3 lb., No. JU..... \$ 2.50
" 3 lb., No. JV..... \$ 2.50
" 3 lb., No. JW..... \$ 2.50
" 3 lb., No. JX..... \$ 2.50
" 3 lb., No. JY..... \$ 2.50
" 3 lb., No. JZ..... \$ 2.50
" 3 lb., No. KA..... \$ 2.50
" 3 lb., No. KB..... \$ 2.50
" 3 lb., No. KC..... \$ 2.50
" 3 lb., No. KD..... \$ 2.50
" 3 lb., No. KE..... \$ 2.50
" 3 lb., No. KF..... \$ 2.50
" 3 lb., No. KG..... \$ 2.50
" 3 lb., No. KH..... \$ 2.50
" 3 lb., No. KI..... \$ 2.50
" 3 lb., No. KL..... \$ 2.50
" 3 lb., No. KM..... \$ 2.50
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" 3 lb., No. KO..... \$ 2.50
" 3 lb., No. KP..... \$ 2.50
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" 3 lb., No. KR..... \$ 2.50
" 3 lb., No. KS..... \$ 2.50
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" 3 lb., No. KU..... \$ 2.50
" 3 lb., No. KV..... \$ 2.50
" 3 lb., No. KW..... \$ 2.50
" 3 lb., No. KX..... \$ 2.50
" 3 lb., No. KY..... \$ 2.50
" 3 lb., No. KZ..... \$ 2.50
" 3 lb., No. LA..... \$ 2.50
" 3 lb., No. LB..... \$ 2.50
" 3 lb., No. LC..... \$ 2.50
" 3 lb., No. LD..... \$ 2.50
" 3 lb., No. LE..... \$ 2.50
" 3 lb., No. LF..... \$ 2.50
" 3 lb., No. LG..... \$ 2.50
" 3 lb., No. LH..... \$ 2.50
" 3 lb., No. LI..... \$ 2.50
" 3 lb., No. LJ..... \$ 2.50
" 3 lb., No. LK..... \$ 2.50
" 3 lb., No. LL..... \$ 2.50
" 3 lb., No. LM..... \$ 2.50
" 3 lb., No. LN..... \$ 2.50
" 3 lb., No. LO..... \$ 2.50
" 3 lb., No. LP..... \$ 2.50
" 3 lb., No. LQ..... \$ 2.50
" 3 lb., No. LR..... \$ 2.50
" 3 lb., No. LS..... \$ 2.50
" 3 lb., No. LT..... \$ 2.50
" 3 lb., No. LU..... \$ 2.50
" 3 lb., No. LV..... \$ 2.50
" 3 lb., No. LW..... \$ 2.50
" 3 lb., No. LX..... \$ 2.50
" 3 lb., No. LY..... \$ 2.50
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" 3 lb., No. MA..... \$ 2.50
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" 3 lb., No. MJ..... \$ 2.50
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" 3 lb., No. MS..... \$ 2.50
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" 3 lb., No. MY..... \$ 2.50
" 3 lb., No. MZ..... \$ 2.50
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" 3 lb., No. NB..... \$ 2.50
" 3 lb., No. NC..... \$ 2.50
" 3 lb., No. ND..... \$ 2.50
" 3 lb., No. NE..... \$ 2.50
" 3 lb., No. NF..... \$ 2.50
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" 3 lb., No. NU..... \$ 2.50
" 3 lb., No. NV..... \$ 2.50
" 3 lb., No. NW..... \$ 2.50
" 3 lb., No. NX..... \$ 2.50
" 3 lb., No. NY..... \$ 2.50
" 3 lb., No. NZ..... \$ 2.50
" 3 lb., No. OA..... \$ 2.50
" 3 lb., No. OB..... \$ 2.50
" 3 lb., No. OC..... \$ 2.50
" 3 lb., No. OD..... \$ 2.50
" 3 lb., No. OE..... \$ 2.50
" 3 lb., No. OF..... \$ 2.50
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" 3 lb., No. OH..... \$ 2.50
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" 3 lb., No. OK..... \$ 2.50
" 3 lb., No. OL..... \$ 2.50
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" 3 lb., No. OR..... \$ 2.50
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" 3 lb., No. OV..... \$ 2.50
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" 3 lb., No. QT..... \$ 2.50
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" 3 lb., No. TU..... \$ 2.50
" 3 lb., No. TV..... \$ 2.50
" 3 lb., No. TW..... \$ 2.50
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" 3 lb., No. UG..... \$ 2.50
" 3 lb., No. UH..... \$ 2.50
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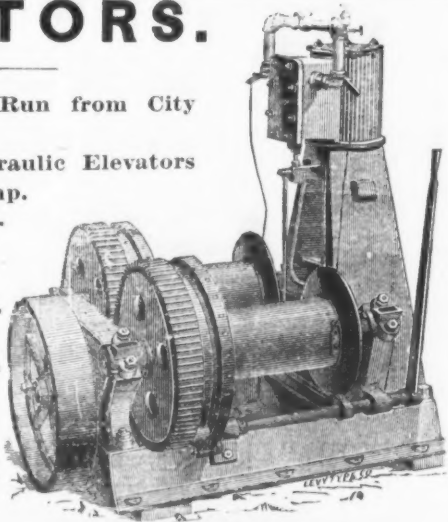
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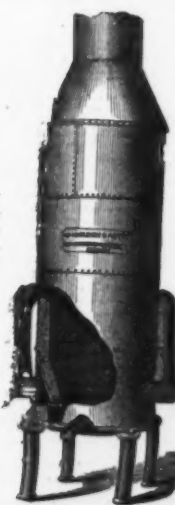
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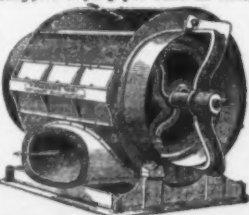
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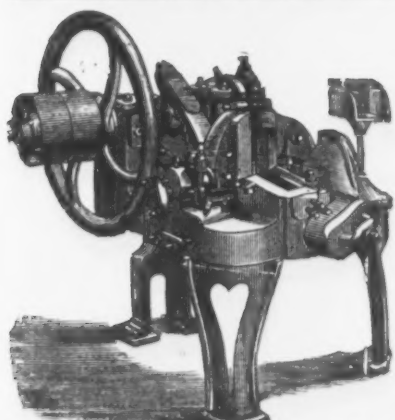
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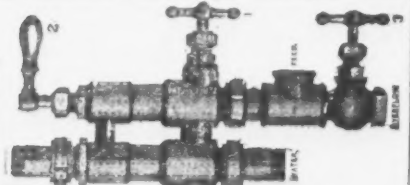
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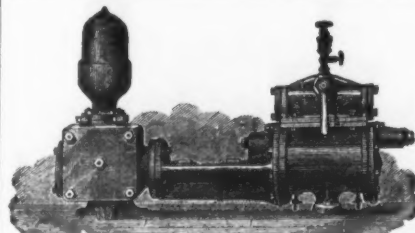


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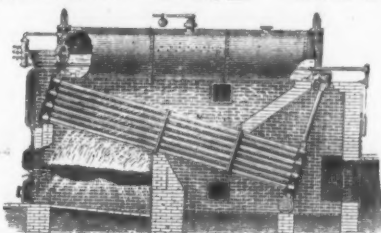
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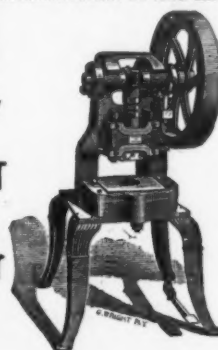
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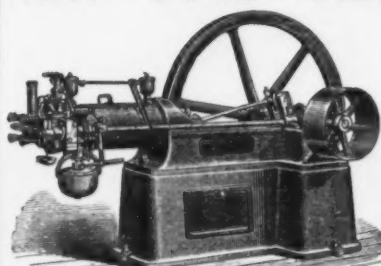


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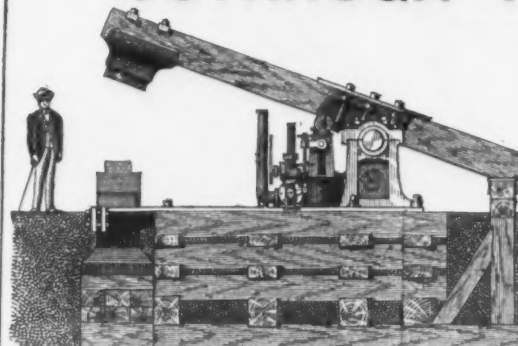
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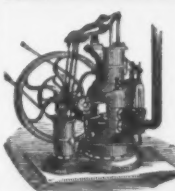
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Reduced Price List.

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For dimensions of Governor, see Illustrated Price List.

Size, Inch.	Plain.	Bright.	Fin.	Extra.	Stop.
1/4	\$15.00	\$17.00	\$1.00	....	....
3/4	16.00	18.00	1.00	....	....
1	18.00	20.00	2.00	....	....
1 1/4	20.00	23.00	2.25	....	....
1 1/2	23.00	27.00	2.50	\$6.00	....
2	27.00	31.00	2.75	7.50	....
2 1/4	30.00	37.00	3.25	9.00	....
2 1/2	36.00	41.00	3.50	11.00	....
3	40.00	46.00	3.75	12.00	....
3 1/4	45.00	52.00	4.25	14.00	....
3 1/2	54.00	62.00	4.50	17.00	....
4	64.00	73.00	5.00	21.00	....
4 1/4	84.00	95.00	5.50	25.00	....
4 1/2	97.00	109.00	6.50	37.00	....
5	112.00	125.00	7.00	42.00	....
5 1/4	132.00	146.00	8.00	50.00	....
5 1/2	150.00	176.00	9.00	60.00	....
6	180.00	198.00	10.00	75.00	....
7	200.00	220.00	12.00	....	....

THE JUDSON PATENT Improved Steam Governor.
No Charge for Boxing or Cartage.
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THE SHIVE STEAM ENGINE GOVERNOR.

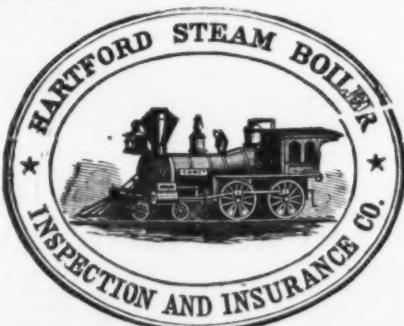
Reduced Price List, Nov. 1, 1879.

Size of Governor	Black	Fin.	Ball and Lever.	Speeder	Auto-matic Safety Check.	Stop Valve.
1/4	\$16.00	\$18.00	\$1.00	\$2.25	....	\$4.00
3/4	18.00	20.00	2.00	2.35	....	5.00
1	20.00	23.00	2.25	2.50	....	6.00
1 1/4	23.00	27.00	2.50	2.75	....	7.50
1 1/2	27.00	31.00	2.75	3.00	....	9.00
2	30.00	37.00	3.50	3.50	....	12.00
2 1/4	45.00	52.00	4.25	4.25	....	17.00
2 1/2	45.00	52.00	4.50	4.50	....	17.00
3	54.00	62.00	5.00	5.00	....	25.00
3 1/4	74.00	84.00	5.50	5.50	....	31.00
3 1/2	84.00	95.00	6.00	6.50	....	37.00
4	112.00	125.00	7.00	7.50	50.00
4 1/4	132.00	146.00	8.00	9.50	60.00
4 1/2	150.00	176.00	9.00	10.00	75.00

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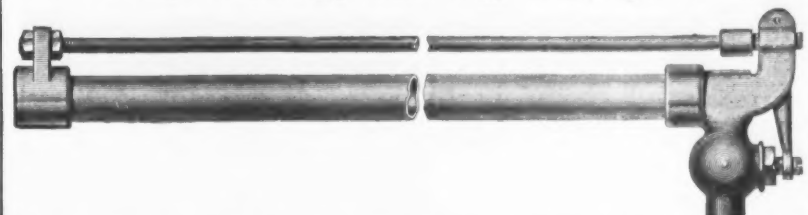
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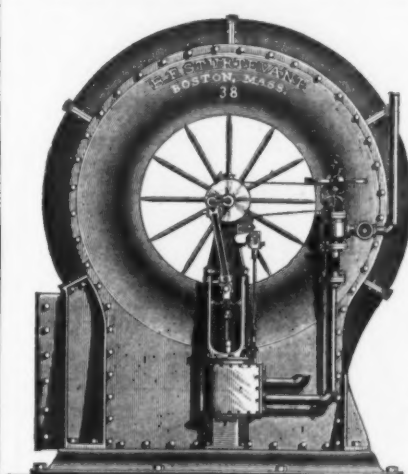
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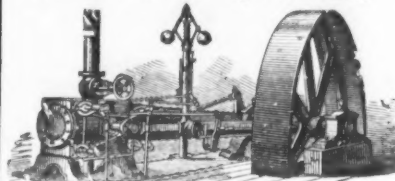
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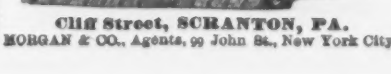
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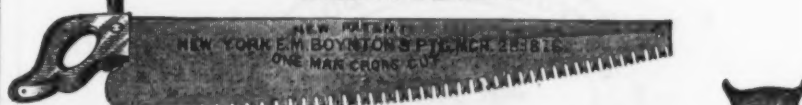


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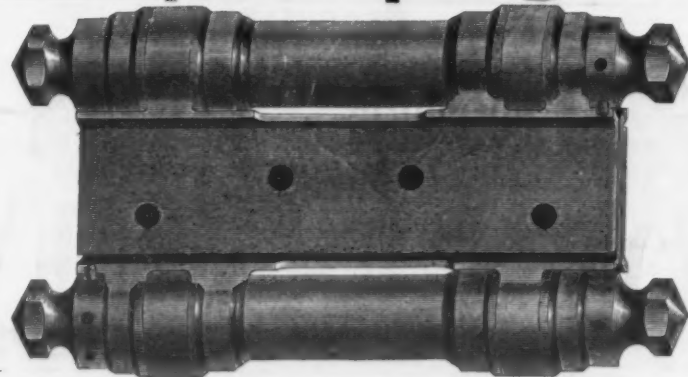
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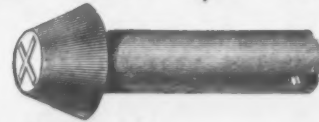
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